Volume 89 Number 18

STEEL

*For forty-eight years*—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

# The Week In Steel

TO ONE thousand steel executives whose interest in the American Iron and Steel institute is depression-proof Charles M. Schwab last Friday submitted (Page 15) a four-point program for ending the depression: A better financial structure, liquidation of extravagances, reduction in the cost of government, an enterprising attitude by industry. And for steel he specifically prescribed: Keep up selling campaigns, keep up advertising, improve production methods. From James A. Farrell came the warning to beware of panaceas and political expedients, to assist recovery by fostering only healthy, economic competition. . . . Sentiment at the institute meeting was moderately hopeful, producers reported an encouraging increase in small orders, visioned (Page 15) a gradual growth of confidence.

## Another Excursion in Socialism

Returning from the institute meeting these executives face a vexing issue—an increase in railroad freight rates (Page 17) revolutionary both in its application and distribution of revenue. Unquestionably steel is saddled with the lion's share of the advance, possibly 40 cents a ton on pig iron. . . . Pooling of the additional revenue with distribution among the weaker roads— as a loan, not as a gift, if the railroad view prevails—makes Chicago apprehensive (Page 18) concerning the rate structure. . . . Pittsburgh is displeased (Page 18) but the expected traffic on its three rivers is assuring. . . . The East is not so certain (Page 18) that the advance actually will be applied.

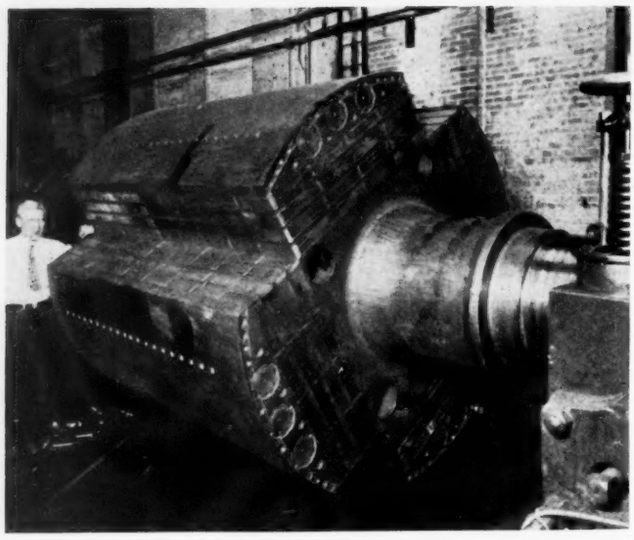
## Railroad Wage Question Is Insistent

Certainly the rate decision, giving the railroads $100,000,000 annually or a quarter of the loaf they sought, forces the railroad wage matter into the open. An interesting rumor, and only a rumor, is that the railroad brotherhoods will volunteer (Page 18) to take a 10 per cent reduction for the period of the depression. . . . Labor is taking a definite stand (Page 19) against any form of unemployment insurance smacking of federal aid. . . . Federal statistics disclose (Page 20) another decline in the cost of living in September.

## Steel Looks Better for the Long Pull

For the long pull the prospects for steel grow more encouraging, even though current production (Page 51) is fractionally off to just below 28 per cent. . . . Railroads are beginning to look (Page 57) to their 1932 track material needs; inquiry for structural steel (Page 54) is

**What new worlds are these departed geniuses of American industry now conquering? Thomas A. Edison and Dr. Charles P. Steinmetz, when the former paid his last visit to the General Electric laboratories at Schenectady, N. Y., in 1922**



**If a drowsy fly had napped on the rim of this rotor, returned by the Brooklyn Edison Co. to the Westinghouse Electric & Mfg. Co. for rewinding, during its 24 years of service it would have traveled 16,900,000 miles, at 240 miles per hour**

broader; a $30,000,000 pipe line project is maturing (Page 70) in the Pacific Northwest. . . . Farm equipment makers, meeting at Chicago (Page 18), take a reassuring view of the future. . . . Oncoming elections are disturbing to British producers (Page 74) but the deflated pound sterling continues to broaden markets. British buyers of continental steel hold to contracts based on the old sterling value.

## 1932 Autos To Be Smart, Low-Priced

Part of this improved outlook for steel originates in Detroit, where new models by practically all manufacturers are on their mark, awaiting the starting gun. Among other things, motordom (Page 25) hears: Chevrolet has scheduled 80,000 units of its new model for November; Graham is radically revising its frame construction to accentuate its low-hung appearance; Hudson-Essex starts production of its new lines Nov. 15; Ford, planning 500,000 units for the first half of 1932, is about to release steel for the redesigned, vibrationless four; Studebaker may call its new low-priced six the Rockne; everything considered, the dollar will buy more automobile value in 1932 than in history.

## Continue Clinic for Open-Hearths

One 5-year program that actually has been completed has developed so many definite and practical recommendations (Page 41) for the elimination of nonmetallic inclusions in open-hearth steel that the research is to be extended for 3 years. . . . Influence of the metallic charge on open-hearth operating economies has been found so important (Page 35) that comprehensive studies are warranted, but generalities for all plants are difficult. . . . Paradoxically, in southern open-hearth plants "flat" heats are termed "snowballs," cast iron borings being used (Page 42) to bring up the silicon content. . . . A flux (Page 36) will rid steel of aluminum oxides, an excess of which causes slag holes in arc welding the steel.

## Alloy Steels Offer Endless Research

Increasingly exacting service requirements of industry are stimulating development of alloy steels. . . . Higher temperatures and pressures, for example, have fostered new alloy steels for bolts and nuts (Page 31), with creep, fatigue and other tests used assiduously. . . . An eastern manufacturer is introducing a new series of low-alloy steels, utilizing chromium, manganese, silicon (Page 46), while a Chicago interest is offering a specially-processed malleable iron. . . . For the manufacture of valves for all internal-combustion powered vehicles an annual consumption of 19,000 tons of steel—mostly alloy—is indicated (Page 44). . . . Automatic control of the blowing cycle of bessemer converters (Page 35) is visualized.

## Mather and Edison Stars Collide, but Rise

Forty years ago a young scientist named Edison went into the iron ore country of western New Jersey to perfect (Page 24) a magnetic process for beneficiating the lean Jersey ores. At Cleveland, a scion of the Mather family was then developing (Page 23) ore properties in the upper lake region and founding a great ore and shipping business. The experiment in New Jersey succeeded, but just as the bonanza richness of the Mesabi deposits was being realized, so the scientist returned to his laboratory Strangely enough, just before dawn of Oct. 18 both figures in this drama—Samuel Mather and Thomas Alva Edison—slipped away. . . . And as he was condoling Mrs. Edison, Dr. S. W. Stratton, founder of the bureau of standards, joined them (Page 24).

## Market Problems Overshadow Production

While tip relief and other technical problems were discussed (Page 39) at the semiannual meeting of the American Gear Manufacturers' association, commercial problems of the industry were paramount. . . . Likewise, at the meeting of the National Association of Sheet Metal Distributors (Page 20) reinstatement by the mills of the former 2 per cent cash discount was outstanding.

# Tempered Optimism Institute Keynote; for Expansion Curb

NEW YORK—With a tempered optimism which was faithful to the sentiment expressed in corridor comment by executives of the industry, Charles M. Schwab as president opened the 40th general meeting of the American Iron and Steel institute, Oct. 23, at the Hotel Commodore.

Conceding that "we have had a real depression and should deal with it as such," Mr. Schwab recounted progress made in the past month, especially the attempt at stabilization by Washington. Necessary for continued improvement in the business situated he cited:

**A better financial structure, which is now under way.**

**Liquidation of extravagances in business including prices, which has already taken place in most lines to an abnormal extent.**

**Reduction in the cost of government, which is borne by industry and the people.**

**A vigorous, enterprising attitude on the part of industry.**

Referring specifically to iron and steel, Mr. Schwab summed up:

**Our house is in order. The financial world is straightening itself out. Industry has got its second wind. Let us sail into the job ahead of us.**

**Keep up the selling campaigns, keep up advertising, improve your production methods. Face the difficulties, but with courage, confidence and knowledge that we are on the upward path.**

Thereby he was sensitive to the general sentiment prevailing at the meeting—that confidence is gradually returning, that even though production continues depressed a number of hurdles requisite to final adjustment have been surmounted. Although attendance at the meeting was impaired by the economy program of the industry, there was no dilution of spirit.

Said Eugene G. Grace, president of Bethlehem:

> While there has been no improvement in actual business, sentiment is a little better, some consumers are showing slightly more interest in their steel requirements, one of the most encouraging developments in business recently is improvement in prices of commodities.

And E. T. Weir, chairman of National Steel:

> Since Oct. 1 our business has improved and I firmly believe we have seen the low point in the steel industry. There has been a marked increase in the number of small orders. I have seen this before in past depressions and when the number of small orders begins to gain it indicates definite improvement is at hand.

And George M. Verity, chairman of American Rolling Mill:

> A new foundation of confidence in the fundamental strength in national and world affairs is certainly in the making following the events of the past year, and particularly the past 90 days.

And Tom M. Girdler, chairman-president of Republic:

> On every side we see signs of better conditions and it is my feeling that the last months of this year will be relatively better than they usually are.

And L. E. Block, chairman of Inland:

> There should be no further dwindling of steel production as there are definite indications in many directions of a better feeling and more confident outlook for the future.

James A. Farrell, vice president of the institute and president of the United States Steel Corp., omitted his usual comments on the business situation at the morning session and took a place on the banquet program. True to an observation from the platform in the morning, he did not touch upon the tariff.

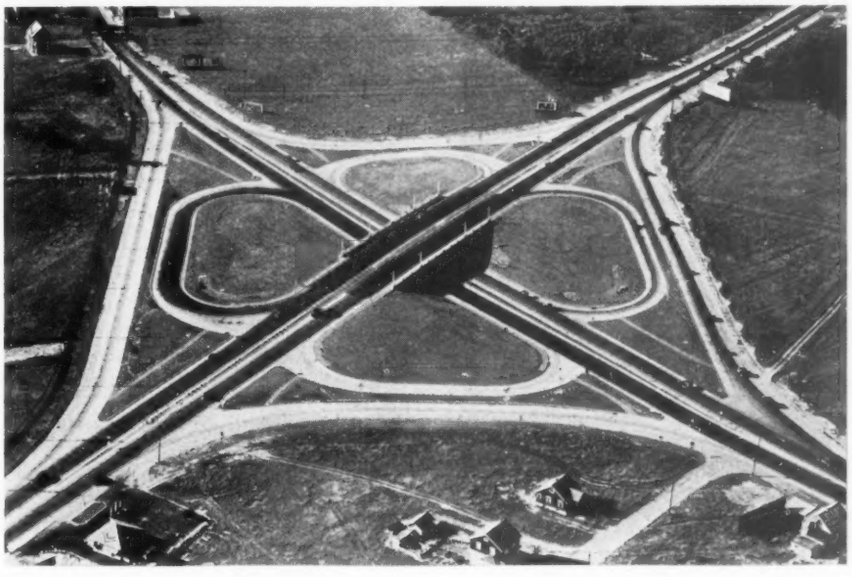
American industry is in no sense to blame for the present depression in trade, declared Mr. Farrell, as the dislocation is world wide. Before American industry is the largest home market in the world, one which has not had its potentialities exhausted. The country's natural resources are great, he assured, and capital is adequate if confidence can be engendered.

**Avoid Political Expedients!**

Various panaceas are being offered to remedy the situation, but few are worthy and industry must turn a deaf ear to proposals which unmistakably bear the earmarks of political expediency, warned Mr. Farrell. There is no royal road to adjustment. The Hoover plan for mobilizing credit and thawing out frozen assets is sound and certain to be of assistance, he maintained.

Last month's reversal in the trend of foreign trade, which has been running against the country for a number of months, was viewed hopefully by Mr. Farrell. Among the things industry can do to help right the domestic situation is to eliminate cutthroat competition. Legitimate competition is essential, but senseless competition is only destructive and is retarding recovery, Mr. Farrell emphasized.

In his address at the morning business session Mr. Schwab referred to



*GOOD LUCK FOR MOTORISTS: Many tons of structural and reinforcing steel went into this traffic cloverleaf near Woodbridge, N. J. All cross-traffic is eliminated at this intersection of Routes 4 and 25*

production of steel ingots in 1931 probably not exceeding 25,000,000 tons, or 16 per cent under expectations, due to a breakdown of finances in Europe, teaching the lesson that the United States can no longer ignore the economy of other countries.

Impressive applause greeted the declaration that "for such a paternalistic measure as the dole we have no place in American life," and "we have abundant evidence of the ruinous efforts of doles and subsidies and artificial stimulants."

Terming indifference to governmental costs as "one of the worst features of our American life," Mr. Schwab said burdensome taxation both federal and local, must be curbed, the incidence of local taxes being more onerous because assessed on homes, farms, factories and other properties regardless of the condition of prosperity.

Reduction of wages he characterized as an inevitable consequence of the depression. For the industry "to encourage uneconomic prices and practices is absurd to say the least—an absolute waste of energy, just rainbow chasing."

Mr. Schwab said further:

I do not believe it is necessary or wise to invoke further the supervision of the government in private business. Reason dictates that we should so conduct our affairs as to afford a just return to both capital and labor.

There will be temporary setbacks, of course, as long as the law of supply and demand is still operating, but in the future, as in the past, business leadership in this country will continue voluntarily to do those things which will in the end redound to the general benefit of all.

We must pause in our foolish race for building capacity. The overbuilding of our industry is as nonsensical as the competition in armaments. The capacity of the steel industry, including uncompleted works, is now 68,000,000 tons of ingots annually. Our rate of production this year is 37 per cent of capacity.

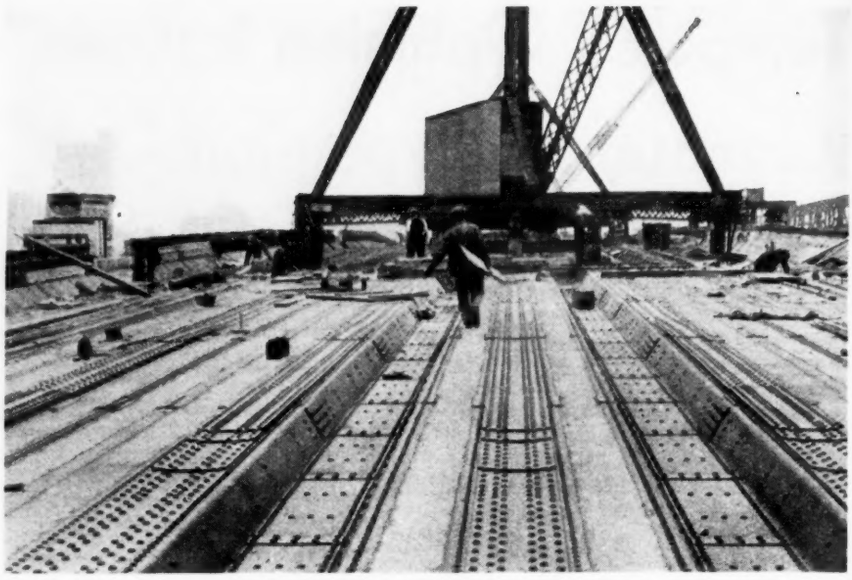
Even in 1929, with its output of 54,000,000 tons, we were using but 80 per cent of the present capacity and that in process of construction. It is wise to build ahead of needs. We shall require these vast facilities to the full. But this is the age of the moratorium. The world needs time to catch up, to adjust.

I, therefore, recommend to the earnest attention of the institute a moratorium on all new building of plants until such time as the need for added capacity is clearly apparent.

In spite of the criticisms that have been leveled at leadership today, I know of no period in our history when management has worked so hard and effectively. We need perspective. Industry has many faults and we have suffered great hardships, but the sense of responsibility which American business has displayed in these times is one of the best omens for our future.

**F. N. Speller**

Chairman, metallurgical advisory board, National Tube Co., Pittsburgh, awarded American Iron and Steel institute medal for best paper presented in past year. His paper, "Co-operative Research in the Iron and Steel Industry" was delivered last May



*Acme Photo*

*RIVETS ACROSS THE SEAS: This roadway of a new bridge being built across the Thames at London discloses about the same practice as in the United States*

At the banquet in the evening, which was attended by about 1050 compared with 1250 at last May's meeting and an average of 1500 to 1600 for the fall meeting, Mr. Schwab presided as toastmaster.

To F. N. Speller, chairman of the metallurgical advisory board of the National Tube Co., Pittsburgh, he presented the American Iron and Steel institute medal which is awarded annually for the best technical paper presented in the preceding year.

Banquet speakers in addition to Mr. Farrell were Fritz Thyssen, German steelmaster who discus ed conditions in the steel industry in Germany; Walker D. Hines, of Washington, director general of railroads during the latter part of government control in the war and postwar period and now an attorney, an authority on the Sherman and Clayton antitrust laws; and Strickland Gilliland, a newspaper man and humorist, of Washington.

Dr. Thyssen, who is chairman of the United Steel Works of Germany, believes stabilization of the German mark at its pre-war value is one cause of Germany's economic difficulties. Reparations he regards as destroyers of national and international economic life, and must be eliminated.

### Present Technical Papers

Technical papers, abstracted on Pages 34, 35, 36, 37, included "Experiments in Speech and Music," by L. S. O'Roark, Bell Telephone Laboratories, New York; "The Bessemer Process and Its Product," by Prof. R. S. McCaffery, University of Wisconsin, Madison, Wis.; "The Metallic Charge in Basic Open-Hearth Operations," by C. D. King, chairman, open-hearth committee, United States Steel Corp., New York; "Magnetic Iron and Steel," by Dr. T. D. Yensen, research engineer, Westinghouse Electric & Mfg. Co., Pittsburgh; and "Factors That Affect the Welding Qualities of Steel," by Wilmer E. Stine, research engineer, Lincoln Electric Co., Cleveland.

The McCaffery paper was discussed by George B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., and Hugh Tiemann, assistant metallurgical engineer, Carnegie Steel Co., Pittsburgh.

The King paper was discussed by Vincent J. Pazzetti, superintendent of open-hearth, Bethlehem plant, Beth-

lehem Steel Co., Bethlehem, Pa., and F. C. Swartz, general manager, Steubenville works, Wheeling Steel Corp., Steubenville, O.

The Yensen paper was discussed by C. A. Scharschu, research engineer, Allegheny Steel Co., Brackenridge, Pa., and the Stine paper by F. T. Llewellyn, United States Steel Corp., New York.

A rising tribute was paid to Samuel Mather, since last May an honorary vice president of the institute and for many years prior to that a director, who died at Cleveland, Oct. 18.

## Financial Notes of Steel And Iron Industry

Laclede Steel Co., St Louis, has declared a quarterly dividend of 25 cents, payable Sept. 30 to record Sept. 24.

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American Forging & Socket Co., Pontiac, Mich., has declared the regular quarterly of 15 cents on the common, payable Nov. 2 to record Oct. 20.

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Mackimmon Steel Corp., Sherbrooke, Que., for the fiscal year ending July 31, showed net profit of $50,307, compared with $102,815 for the preceding year.

## Delays Montreal Terminal

Toronto, Ont.—Structural steel fabricators and manufacturers of railroad equipment have been notified by the Canadian National Railways that it is discontinuing work on its Montreal, Que., terminal, and to hold back on material for that project. The holdup is temporary, due to decreased revenue. About 1500 men are laid off as a result.

# Freight Rate Rise Heavy on Steel; Wages Coming Issue

WASHINGTON—Steel apparparently will contribute relatively more than any other major industry to the financial pool to be raised for the benefit of the weaker railroads by means of freight rate increases granted by the interstate commerce commission Oct. 13.

While flatly denying the railroads the 15 per cent horizontal advance petitioned for as of June 17, the commission has allowed advances of $3 and $6 per car on certain commodities and 1 and 2 cents per 100 pounds on others—the latter being subject to a maximum of 10 per cent.

In its decision the commission suggested acceptance by the railroads on or before Dec. 1. Railroad executives, meeting at Atlantic City, N. J., Oct. 22, voted to accept, contingent upon the benefiting carriers accepting the distribution of increased revenue as a loan, not as a gift, and that no benefiting road pay dividends.

### Formalities Delay Change

Presumably, this acceptance will be transmitted immediately to the commission, and there will then remain the formality of filing tariffs, which under the 30-day rule might become effective about Dec. 1 if the railroads make speed.

Undoubtedly the steel industry is hit hard, beginning with the assembly of raw materials for the blast furnace and continuing through the shipment of finished steel. Because the advances are imposed chiefly on a per-car basis, the exact burden is difficult to figure, but one authority estimates that finished steel laid down at the consumers' door from an integrated producer will cost 60 cents more per ton, from a nonintegrated producer 70 cents.

On iron ore, coke, limestone, bituminous coal and anthracite the commission is permitting an advance of $3 per car.

On slag moving from the furnace the impost also is $3 per car. On pig iron moving either to a foundry or to a steelworks the rise is $6 per car, a rate which also applies to scrap. Because billets take the pig iron rate, presumably they are also subject to $6 per car additional.

Finished steel is covered by the omnibus clause imposing 2 cents per 100 pounds. Since the commission stipulated that "in no event shall the increase levied on any carload be in excess of 10 per cent of the carload charges which would be assessed in absence of the increase," the advance on rates of 20 cents per 100 pounds or less will be 10 per cent; on rates in excess of 20 cents the 2-cent rise will apply, varying according to the size of the car, but for an 80,000-pound car being $16.

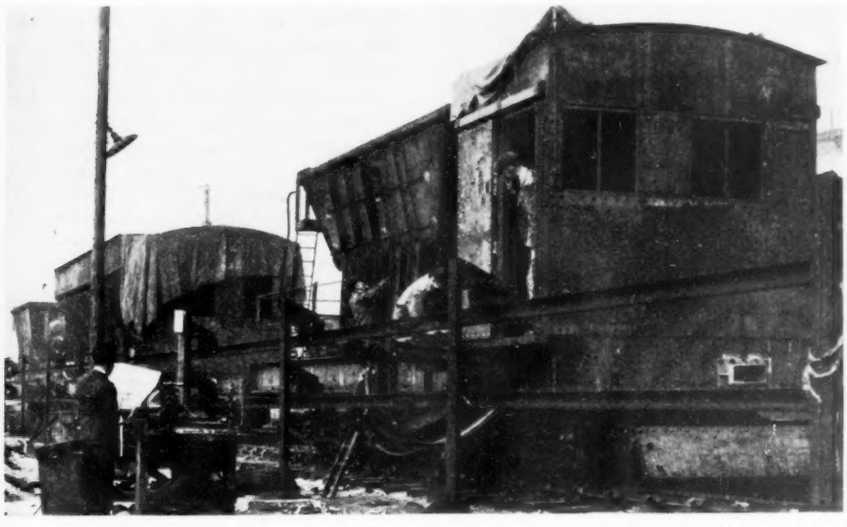
### Other Charges Defined

Switching charges go up 10 per cent, except in the Chicago district. On export rates, only that portion which is strictly domestic will be affected. The increases apply to steamship rates subject to the commerce commission act. On less-carload rates the commission has decreed:

In the case of less-than-carload freight, no increase shall be assessed for hauls for which the applicable or corresponding rates are assessed on a basis of not more than 175 miles, and the increase for hauls over 175 miles and not over 250 miles computed in like manner shall be 1 cent per 100 pounds.

Because iron ore takes a rail haul from the upper lake mines to the upper lake docks, and for the so-called interior furnaces a second haul from the lower lake docks, pig iron producers have been uncertain concerning a possible double charge, but the commission stipulated under the heading "combination rates" that "it is the intention to authorize but one increase on any particular through shipment, however the total rate is constructed or ascertained."

Now, iron ore moving from the Mesabi range in Minnesota to Pittsburgh district furnaces does not constitute a



*Wide World Photo*

*SENTENCED TO SIBERIA: These electric ore cars are being constructed by Newton & Chambers, of Sheffield, Eng., for use in the Siberian mines of the soviet government. This is the second order in a fortnight*

"through shipment" but the presumption is that the principle of only one increase will also apply in such instances. Fabrication-in-transit rates certainly would thus be construed.

Obviously there will be a tendency to load freight cars more heavily. This is an attitude which the railroads have been educating shippers to, but now it will be at the railroads' expense. It will be natural for shippers to seek the larger types of cars; for the railroads to make more intensive use of smaller ones.

In a good many quarters there is a disposition to regard the present rate situation only as a forerunner to a general adjustment of the railroad wage situation. The 15 per cent advance sought by the railroads would have increased their revenues between $400,000,000 and $500,000,000 annually; the advance granted is estimated at $100,000,000. In other words, no major relief has been given.

Some measure of relief is expected to emanate from the White House. It is known that the President has been conferring with financial and railroad leaders on a plan which would stabilize securities of the weaker roads. The rate decision now opens the way for the White House to act.

The conviction persists that railroad wages—virtually the only item of railroad operating expenses still on a postwar basis—must be adjusted. Recently railroad executives have become bolder in their assertions, although at the Atlantic City meeting, Oct. 22, wages were not mentioned.

A rumor is current that the railroad brotherhoods, aware that their wage scales are vulnerable and sooner or later will be under attack, will shortly voluntarily proffer to take a 10 per cent reduction for the period of the depression. This strategy would preserve present scales for better times and be no more of a concession than the railroads probably would demand. And if the four big railroad brotherhoods took the lead, presumably other railroad unions would follow.

## Pittsburgh Avoids Some Rises by Water Movement

PITTSBURGH—Dissatisfaction is expressed by steel producers over the action of the commision in answering the railroads' appeal for higher rates. Steel producers recognize the importance of preserving the efficiency of our leading transportation system and of maintaining its purchasing power, but feel that if higher rates are warranted that a horizontal advance of 5 to 7 per cent would have been preferable to the plan proffered so far as the facilitating of cost determination is concerned.

If the suggested $3 per car advance on iron is applied only once, it is estimated that on the basis of the present low rate of pig iron production the freight bill from Lake Erie to Pittsburgh will be increased $500,000 annually, or $1,000,000 should a double charge be permitted on ore. In a normal operating period these charges would be doubled.

Increased freight charges on coal shipments would have a less serious effect here than at Chicago, Cleveland, Buffalo or Youngstown inasmuch as the bulk of this tonnage is moved from mines to coke ovens by river barges. This applies to the independent producers as well as to the United States Steel Corp. The latter, however, is in a better position than the independents to escape the imposition of a higher rate on ore shipments, operating the Besemer & Lake Erie railroad from Lake Erie to Pittsburgh as well as northern ore carriers.

The $6 advance on iron and steel scrap would mean an increase of about 15 cents per ton in the delivered cost of this material, and if completely absorbed by the mills would represent a large sum annually, although it is questionable whether the full amount or even part could be passed on by the dealer.

Little faith is placed in the contention that advancing rates on finished steel products will stimulate anticipatory buying to any marked degree since the proposed increase would mean only 40 cents a ton, a figure regarded as too low to interest buyers in abandoning their present hand-to-mouth policy.

## Chicago Sees Railroad Rate Structure Undermined

CHICAGO—Views of steel company traffic officials here are that while the freight rate recommendations of the interstate commerce commission for increases per car and per 100 pounds, chiefly on raw materials and manufactured products, may have a beneficial effect on conditions as related to railroad buying, nevertheless, the acceptance of the pooling setup by the railroads would tend to distort the whole freight rate structure which has been built up through long years.

On the other hand, it is pointed out that the steel industry, already suffering as much or more than the railroads, will be forced to accept an added heavy freight burden.

The proposal of an increase of 2 cents per 100 pounds on finished steel products is regarded as a load that the steel industry at this time can ill afford to bear. Despite this, a number of steel officials here are hopeful that the railroads may be put in a better financial condition to buy steel products, if they actually are sincere in accepting this as aid offered in response to their appeals.

To the steel scrap industry may fall a most distressing burden. An assessment of $6 a car is interpreted here as indicating that much of the scrap originating in points isolated from consuming centers, and now moving freely, would become stagnant. It is considered doubtful whether much of the scrap now moving from scattered outlying points ever again would enjoy a similar movement under such tariff as has been proposed.

Opinions are fairly general that this proposal eventually will result in the revamping of the entire railroad finance structure so that provision will be made for the retirement of railroad bonds, such as exists in other industries and businesses.

## East Sees Wages Issue

PHILADELPHIA—The steel trade here estimates that the interstate commerce commission's proposed increase of $3 and $6 per car on various commodities, will increase the cost of producing and delivering pig iron about 40 cents a ton. Many believe these increases will not materialize, looking to a reduction in railroad wage rates as the real issue.

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## Farm Equipment Makers Optimistic as to Future

Chicago—Farm equipment credits and research were important subjects considered at the thirty-eighth annual convention of the National Association of Farm Equipment Manufacturers in Chicago, Oct. 21-23, at which reassuring prospects for the future were sensed.

H. G. Newcomer, Eureka Mower Co., Utica, N. Y., retiring president of the association, pointed out that the history of the farm equipment industry records numerous periods of depressed volume, and that each of these has been followed by spirited demand. The question of price reductions for farm equipment was not taken up officially by the convention.

A few tractor plants are operating on better schedules, and considerable production for inventory has been laid aside for winter operations. Stock inventories are less of a problem. Further liberalization of credit terms was advocated by some manufacturers, while others took the view that further extensions of long-term credits would be detrimental to the industry.

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## Car Needs 7.6 Per Cent Less in Fourth Quarter

Freight car requirements for the fourth quarter are estimated to be 7.6 per cent under those needed in the third quarter. By commodities, agricultural implements are calculated to reveal a 41.9 per cent decline, ore and

concentrates 24.1, and machinery and boilers 23.1 per cent.

Though the estimated decline for all districts is 7.6 per cent, the northwest territory will show the largest drop, 18.7 per cent, and the southeast district the least, with no change anticipated. No district of 13 reporting counts on an increase in the fourth quarter.

Iron and steel carloadings the country over may be expected to show an 11 per cent drop from third quarter. Compilations are by the Regional Shippers' Advisory boards to the car service division, American Railway association.

## Executives Cautious on Employment Insurance

Wariness exists in the average executive's mind as to the efficacy of unemployment insurance as a cure for the evils of unemployment, judging from replies to a questionnaire mailed to 2000 business and industrial executives by the Industrial Standards Corp., Chicago.

Two hundred sixty-six replies were received, of which 48.5 per cent favored some form of unemployment insurance; 44.6 per cent were opposed to it, and 6.9 per cent were noncommittal. Of those favoring insurance, 45 per cent preferred that the individual company carry its own risk; 26.4 per cent registered for a national program; 24 per cent for group, or trade association management, and 4.6 per cent for state control.

Another question related to the feasibility of adjusting the working schedule as a corrective measure. Of the 266 replies received 47.3 per cent favored a shorter working week; 37.2 per cent were opposed; 0.5 per cent gave a conditional answer, and 15 per cent were noncommital. As to shortening the daily working hours, 36 per cent favored such a course, 54 per cent expressed opposition, and 10 per cent failed to answer.

The replies also revealed that in the majority of companies which have reduced wages, the employes' reaction has been favorable, and in comparatively few has there been open resentment.

## Revises Rule on Sampling

Washington—The commissioner of customs, F. X. A. Eble, has notified collectors of customs of the amendment to the customs regulations relating to sampling and assaying of crude metals. The new amendment is:

"In the case of crude metals in any form, the sampling and assaying shall be done under government supervision and in accordance with the commercial practice in effect at the plant."

# Senators Find Little Support For Compulsory Insurance

WASHINGTON — Action by the American Federation of Labor in voting down, at its recent convention, suggestions for compulsory unemployment insurance under government supervision is likely to weigh heavily in deliberations by the senate committee now studying the question. Further, it probably will prove a strong influence against the adoption of insurance legislation at the coming session of congress.

That the issue has not yet been fully settled is evident from the fact a considerable proportion of the membership of the federation represented at the convention strongly favored compulsory insurance, and a certain group in congress has been urging legislation.

Members of the senate committee are Senator Herbert, Republican, Rhode Island, chairman; Senator Glenn, Republican, Illinois, and Senator Wagner, Democrat, New York. Mr. Wagner is author of the resolution that created the committee and ordered the investigation. He is sponsoring legislation.

It was no surprise to the committee that the federation rejected the insurance plea, as it merely reaffirmed the stand it took in 1930. But despite the organization's official attitude last year, bills providing for insurance were introduced in congress and in the majority of state legislatures, where they were advocated by radical groups, including some federation representatives.

The statement by William Green, federation president, that compulsory insurance systems would be inadequate, and lead inevitably to the dole, to the disadvantage of the working classes, won the fight for the "antis." Mr. Green also promised to appear before the next congress and insist that "millions, if not billions" be appropriated "to relieve this distress."

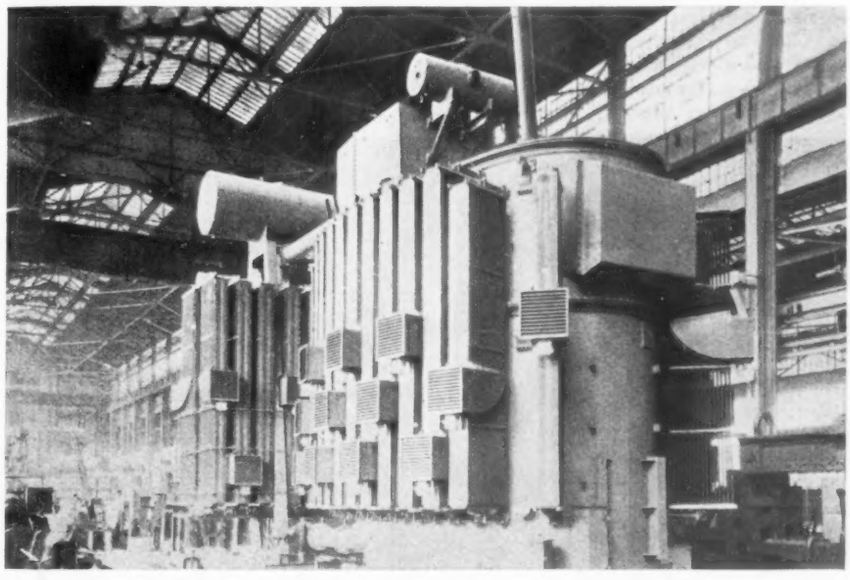
The senate committee has been interviewing business and industrial leaders. Gerard Swope, president, General Electric Co., appeared last week and stressed the fact he favors voluntary action by individual industries in initiating insurance, rather than legislation. He added, however, "we never would get universal insurance without government action."

**Employes Share Cost**

He explained that such action would be entirely supervisory, with corporations and their employes sharing the entire cost of insurance.

Mr. Swope said that employes must be assured protection. "By protection," he stated, "I do not mean a protection that is given to them, but a protection that they themselves help to provide."

So far the committee has found little on which to base a case for compulsory unemployment insurance,



*WORLD'S LARGEST TRANSFORMER: So says Westinghouse Electric & Mfg. Co. of this self-cooled two-winding, 70,000-kv-a unit, weighing 220 tons, standing 28 feet high. It was shipped from the Westinghouse Sharon, Pa., plant to Hell Gate, N. Y., station of the United Electric Light & Power Co.*

at least, not of the type advocated by radical groups. Among those asked to appear are George G. Crawford, president, Jones & Laughlin Steel Corp., Pittsburgh; Howard Coonley, president, Walworth Co., Boston, and Col. W. E. Starrett, Thomp on-Starrett Co., New York.

## Living-Cost Index Slightly Lower for September

The index of the cost of living for wage earners, as compiled by the National Industrial Conference board, New York, was 0.3 per cent lower in September than in the preceding month, and 10.3 per cent lower than in September, 1930. The purchasing value of the dollar was 116.8 cents, as compared with 100 cents in 1923.

## Sheet Output Steady in August; Shipments Down

Sheet sales reported by the National Association of Flat Rolled Steel Manufacturers, Cleveland, averaged 4023 net tons daily in September, a gain of 1.5 per cent from the daily rate in August. Production was at the rate of 3895 tons, a decrease of 2.4 per cent. The change in both instances was much less pronounced than in recent months, indicating a steadier situation. Shipments, averaging 4112 tons, were 18 per cent lower than in August. Sales totaled 120,688 tons; production, 116,842 tons; and shipments, 123,371 tons.

Unfilled tonnage as of Oct. 1 was 167,366 tons; approximate finished stock on hand awaiting shipment, 75,816 tons, and approximate stock unsold, 67,337 tons. Total sheet capacity in the United States for September was approximately 540,600 tons, and the capacity on which the association's figures are based was 365,400 tons.

# The Business Week In Washington

CONGRESS will not be asked for an appropriation for the operation of ships for the fiscal year ending June 30, 1933, the United States shipping board has announced.

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Public and semipublic works contract awards amounting to $31,910,513 were reported to the public works section of the President's organization on unemployment relief last week. The reported total of contracts since Dec. 1 is $2,591,597,252.

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The President's organization of unemployment relief states that a general improvement in business conditions is being reported in the East.

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There will probably be no tax increases at the coming session of congress, according to Senator George Moses, president pro tempe of the senate.

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Papers under the Webb-Pomerene law have been filed with the federal trade commission by the Signal Export association, for exporting railway signal equipment and other apparatus.

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Senator Couzens, of Michigan, has announced that he will reintroduce at the coming session of congress his bus regulation bill. He will also reintroduce his bill prohibiting railroad consolidations until after congress has made an investigation.

# Steel Companies Awarded Safety Trophies

STEEL companies again were high in the lead among industrial groups rewarded for safety work at the twentieth annual national safety congress and exposition, Chicago, Oct. 12-16. A number of plants in the metals section had no lost-time accidents during the past year. The accompanying illustration shows a group to which trophies and certificates were presented. Left to right: R. A. Beyer, Central Tube Co., Ambridge, Pa.; J. A. Coltrain, National Radiator Corp., Johnstown, Pa.; J. C. Bilek, Driver-Harris Co., Harrison, N. J.; Dr. R. C. Engel, Corrigan, McKinney Steel Co., Cleveland; C. W. Bergquist, Western Electric Co., Chicago, holding plaque awarded to Whiting Corp., Harvey, Ill.; W. A. Gimbel, General Electric Co., Philadelphia works; John M. Turnbull, Kensington Steel Co., Chicago; A. I. Lynch, Ohio Brass Co., Mansfield, O.; G. W. Corkan, Beaver Falls, Pa., plant of Union Drawn Steel Co. unit of Republic Steel Corp.

# Sheet Distributors Ask Old Discount

RENEWED pressure for a larger cash discout on steel sheets from the mills and consideration of marketing problems comprised the program on Oct. 20 of the National Association of Sheet Metal Distributors, as a part of the thirty-seventh annual convention of the National Hardware association and American Hardware Manufacturers' association in Chicago. Three to four months of continued discouraging business in sheet products is expected, but views were expressed that probabilities of a more stable position for banking houses, through operation of the national credit pool and other constructive measures, offer support to the outlook for a more definite upward turn later.

Sharp criticism of sheet mills in not reinstating the former 2 per cent cash

(*Concluded on Page* 46)

## American Cable Supplied Wire for Delaware Bridge

In an article on page 20 in the Oct. 5 issue of STEEL in connection with plans for the opening of the George Washington bridge, connecting New York with Fort Lee, N. J., the statement was made that cables for the Delaware river bridge, between Philadelphia and Camden, N. J., were furnished by the John R. Roebling's Sons Co. organization. This is an error.

Wire for the Delaware bridge cables was drawn and furnished by

the American Cable Co., including the suspension ropes, the material being drawn by the Page Steel & Wire Co., a subsidiary of the American Cable Co. The cables were erected and spun by the Keystone State Construction Co. which held the general contact for the bulk of the work on the large suspension bridge between Philadelphia and Camden.

The American Cable Co. has recently been awarded the contract direct for the furnishing material, erecting and spinning cables for the Golden Gate Bridge, which, according to present plans, will be the largest suspension bridge in the world.

## August Stoker Sales Are Highest Since July, 1930

Total number of mechanical stokers sold in August was 132, a noteworthy gain over July and the highest monthly total since July, 1930. Gain was chiefly in stokers installed under water-tube boilers, as 21 manufacturers report to the department of commerce:

| 1930 | Stokers sold | Fire tube boilers | Water tube boilers |
|---|---|---|---|
| August | 115 | 61 | 54 |
| 8 mo. | 835 | 396 | 439 |
| September | 128 | 71 | 57 |
| October | 92 | 46 | 46 |
| November | 71 | 41 | 30 |
| December | 53 | 35 | 18 |
| Year | 1,179 | 589 | 590 |
| 1931 | | | |
| January | 85 | 40 | 45 |
| February | 66 | 37 | 29 |
| March | 63 | 27 | 36 |
| April | 65 | 32 | 33 |
| May | 80 | 29 | 51 |
| June | 111 | 55 | 56 |
| July | 101 | 58 | 43 |
| August | 132 | 59 | 73 |
| 8 mo. | 703 | 357 | 366 |

## Curtailment Continues in Shipment of Locomotives

Domestic shipments of railroad locomotives in September continued at the same depressed rate as in August but the complete cessation of foreign shipments made the month's total at a new low. Principal manufacturers' reports are incorporated in the following department of commerce table:

| | Shipments | | Unfilled Orders | |
|---|---|---|---|---|
| 1930 | Domestic | Foreign | Domestic | Foreign |
| Sept. | 65 | ..... | 169 | 5 |
| 9 mo. | 602 | 19 | ..... | ..... |
| Oct. | 50 | ..... | 127 | 5 |
| Nov. | 43 | ..... | 88 | 5 |
| Dec. | 44 | 5 | 104 | ..... |
| Year | 739 | 24 | ..... | ..... |
| 1931 | | | | |
| Jan. | 16 | ..... | 90 | 1 |
| Feb. | 15 | ..... | 92 | 11 |
| March | 10 | ..... | 83 | 12 |
| April | 14 | 1 | 69 | 11 |
| May | 26 | ..... | 47 | 11 |
| June | 19 | ..... | 84 | 11 |
| July | 12 | 1 | 75 | 11 |
| Aug. | 3 | 13 | 73 | 1 |
| Sept. | 4 | ..... | 119 | 1 |
| 9 mo. | 119 | 12 | ..... | ..... |

# Seek Higher Specifications For Railroad Castings

NEW YORK—Efforts by one large railroad buyer of steel castings to revise specifications on A. R. A. class B steel, increasing yield point 2000 pounds to 38,000 and with corresponding increases in tensile strength, elongation and other details brought about discussion at the meeting of the Steel Founders Society of America in New York, Oct. 22. A committee will be appointed to study the problem and strive for united action.

Pointing out that producers of steel castings are successful in more than meeting accepted class B steel castings to insure a margin of safety against tests for that class of steel, Mr. Lorenz stated the ultimate result in meeting new specifications would be to lift even higher this margin of safety, and, with 38,000 pounds required for the yield point, the margin might bring the casting to 40,000 as a yield point. This would without question result in analysis changes and revisions in heats and treatment.

### Better Steel at Same Cost

General opinion was that the effort was to obtain a superior steel at the same cost, although higher cost of production would be certain. R. A. Bull, director, Electric Steel Founders' Research group, pointed out that while this revision in specifications may have started with railroads, there was a strong likelihood of it spreading to other industries using steel castings.

G. R. Casey, Treadwell Engineering Co., Easton, Pa., vice president of the Eastern division of the society, pointed out the dangers of attempts to avoid basic economic laws as to prices and declared "there is no surer way to receivership than dispose of our merchandise at prices which do not return to us at least the money expended in production of said merchandise."

In reporting on business and outlook, most individuals noted little change in demand or operations.

P. C. Rogers, Roxbury Steel Castings Co., Boston, declared that importance of pattern equipment often meant the difference between profit and loss on some orders, and detailed the difficulty in estimating from some blue prints what pattern requirements would be. Col. Willard T. Chevalier, McGraw-Hill Publishing Co., New York, in an address on the importance of merchandising, declared that the manufacture of orders was as much a factor in successful business as the manufacture of the product.

W. W. Nichols, Allis-Chalmers Co., Milwaukee, speaking on "Co-operation and Its Use," claimed that individual prosperity depends on the success and progress of industry as a whole. W. E. Farrell, Easton Car & Construction Co., Easton, Pa., spoke briefly on firm bidding and stressed the importance of holding to first quotations arrived at after thorough study of the inquiry, requirements and costs.

## September Order Index Up For Foundry Equipment

At an index of 31.9, September's index of foundry equipment orders turned upward from the low of August, 16.9, thus ending a five-month steady decline. Unfilled orders improved at 35.6, against September's 32.1 index figure. Shipments at 29.6 worked down from August's 37.4 according to report of members to the Foundry Equipment Manufacturers' association:

| | 1931 | 1930 | 1929 | 1928 |
|---|---|---|---|---|
| Jan. | 65.3 | 160.1 | 180.5 | 132.7 |
| Feb. | 54.7 | 196.4 | 197.0 | 123.6 |
| Mar | 174.4 | 164.1 | 209.4 | 138.6 |
| Apr. | 57.7 | 122.8 | 172.6 | 107.7 |
| May | 54.1 | 92.7 | 177.7 | 335.6 |
| June | 40.9 | 102.1 | 177.3 | 149.1 |
| July | 38.7 | 90.6 | 219.3 | 94.8 |
| Aug. | 16.9 | 85.2 | 229.5 | 278.0 |
| Sept. | 31.9 | 91.0 | 216.3 | 170.0 |
| Oct. | ..... | 50.0 | 245.3 | 185.0 |
| Nov. | ..... | 45.3 | 128.6 | 197.8 |
| Dec | ..... | 59.8 | 208.0 | 166.5 |

Base: Average monthly shipments for 1922-23-24 taken as 100.

## Sees Draftsmen Barometer Of Building Business

New York—A monthly check on the number of draftsmen employed by the architects of the country would be the most sensitive barometer possible for the building industry, declares E. D. Litchfield, of the New York chapter of the American Institute of Architects.

According to Mr. Litchfield, New York City will be faced with a housing shortage in two years because the city's population is increasing, buildings are growing obsolete, new construction is light.

## Canada 1930 Iron, Steel Value Is $52,588,934

Factory sales from the primary iron and steel industry in Canada in 1930 were valued at $52,588,934. This value, which represents the amount actually received by producers for the sale of pig iron, ferroalloys, steel ingots, direct steel castings and rolled iron and

steel products compared with $72,251,995 for 1929, a decrease of 27 per cent.

In 1930 a total of 34 firms operated 49 different plants or departments engaged in these lines, with a capital of $112,079,926, employing an average of 9723 persons, who received in salaries and wages $14,834,835. Expenditures for fuel and electricity amounted to $5,182,136, and material purchased for manufacturing purposes cost $22,765,648.

Output for 1930 included pig iron, 749,148 tons, ferroalloys 65,223 long tons, steel ingots 956,888 tons, steel castings 52,690 tons.

## Why Davis Quit Puddling

Sen. James J. Davis of Pennsylvania, former secretary of labor, disclosed the reason why he turned from puddling in his earlier days, in addressing the Cleveland Purchasing Agents, association, Oct. 15.

In 1893 to 1897, while Mr. Davis was a puddler at Sharon, Pa., steel billets were coming into active competition with wrought iron. Billets dropped from $32 a ton to $26, bar iron sold down to 1.25c.

Hence puddlers' wages receded from $5.75 a ton to $5.25, then to $4.50 and to $4, "and when my wage got down to $4, I quit the puddling trade," declared Senator Davis. "There did not seem to be much of a future in that line."

## Implement Prices Cut

Chicago — International Harvester Co., in announcing 1932 implement prices, is passing along economies in manufacturing costs. Other implement companies are also expected to reduce prices. International Harvester has been operating 4 days a week, compared with 3 recently.

# Men of the Industry

WILLIAM P. WITHEROW, formerly president of the Witherow Steel Corp., Pittsburg, and later a vice president of the Republic Steel Corp., Youngstown, O., has resigned "to devote his time to his many private and personal interests which have multiplied greatly in past years."

Mr. Witherow, who in 1913 organized his own company, and in 1920 developed the Witherow die rolling process, merged his company with the Donner Steel Co., Buffalo, in 1929, becoming chairman of the Donner organization. When the Republic Steel Corp. was organized, late in 1929, Mr. Witherow became affiliated with the Republic corporation. Mr. Witherow also was president of Dilworth, Porter & Co., Pittsburgh, after he acquired that company in January, 1929.

Mr. Witherow is a director of the Pittsburgh Coal Co., and Steel Products Co., Pittsburgh, Midwest Forge Co., Cleveland; Spencer Mfg. Co., Spencer, O., and two Pittsburgh banks.

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E. R. Dougherty has joined the sales organization of American Manganese Steel Co., Chicago Heights, Ill., in the Chicago district.

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N. E. Wahlberg, chief engineer, Nash Motors Co., Kenosha, Wis., has been elected vice president of the company.

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Herman Merker, secretary, Pressed Steel Tank Co., Milwaukee, has been placed in charge of market research and development for the company.

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Thomas W. Pangborn, president, Pangborn Corp., Hagerstown, Md., recently served as chairman of a committee of three directors of the Hagerstown Bank & Trust Co., which raised $1,000,000 in three days to strengthen this banking institution and stabilize the banking situation in Hagerstown.

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E. M. Lurie, formerly with Associated Metal Lath Mfrs., Chicago, is now affiliated with the Milcor Steel Co., Milwaukee.

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Charles E. Cole has been appointed factory representative for R. G. Le Tourneau Inc., Stockton, Calif., maker of heavy grading machinery.

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Robert A. Blair, Perry Furnace Co., Erie, Pa., has been elected president of the new Foremen's association which has just been formed in the Erie district.

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Lawrence R. Tierney has joined the Philadelphia district sales organization of the Debevoise-Anderson Co., offices in the Stephen Girard building, Philadelphia.

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C. K. Strausbaugh has been appointed vice president in charge of sales, Mead-Penn division, New Castle, Pa., of the newly formed Pennsylvania Engineering Corp., New Castle, Pa.

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L. B. Mitchell, sales manager, Sutton Engineering Co., Pittsburgh, sailed from New York, Oct. 19, in the interest of his company's foreign business. He will be abroad about two months.

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Harlow D. Burnside, factory manager, Clark Tructractor Co., Battle Creek, Mich., plant, has assumed charge of the manufacturing program of Universal Cooler Corp., Detroit.

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J. B. Wallis has been appointed manager, eastern district, Ohmer Fare Register Co., Dayton, O., with headquarters in New York. Prior to his association with the Ohmer company, Mr. Wallis was southeastern district sales manager for Remington Cash Register Co.

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Ralph D. Nye, recently chief engineer, Wheeling Mold & Foundry Co., Wheeling, W. Va., has joined Lewis Foundry & Machine Co., Pittsburgh, being engaged in sales and engineering work.

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Frank Armstrong, Pickands, Mather & Co., and vice president and director, Empire Steel Corp., Mansfield, O., has been elected a director of American Shipbuilding Co., Cleveland, to succeed Elton Hoyt II, resigned.

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Milton M. Clark, formerly vice president, Truscon Steel Co., Youngstown, O., and more recently president, Campbell Industrial Window Co., New York, has become president and director, Vitaglass Corp., New York.

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G. W. Davies, formerly assistant secretary, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., has been named assistant to the president in charge of sales for Lakey Foundry & Machine Co., Muskegon.

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Ray C. White has been appointed eastern representative, Electric Furnace Co., Salem, O., in charge of both electric and fuel furnace sales for northeastern Pennsylvania, eastern New York and New England with headquarters in New York.

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Earl Campbell has been named manager, jobbing department, F. H. Lawson Co., Cincinnati, distributor in that district for American Rolling Mill Co., Middletown, O. E. G. Harvey has been placed in charge of specialty sales in the same district.

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O. A. Ahlers is now purchasing agent, City Machine & Tool Works, Dayton, O., having recently resigned as secre-

tary-treasurer and purchasing agent, International Tool Co. At one time, Mr. Ahlers was with City Machine & Tool Works, previously.

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Harry H. Hannum, formerly with Hannum Mfg. Co. and its predecessor, Lavine Gear Co., Milwaukee, as well as Oakland Motor Car Co., Pontiac, Mich., has been named purchasing agent, Heintz Mfg. Co., Philadelphia, maker of steel auto bodies and parts.

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Leon P. Alford, former editor, *American Machinist, Industrial Management* and *Management Engineering*, and at present consulting editor, *Factory and Industrial Management*, will be presented with the Henry Laurence Gantt memorial medal by the American Management association at a dinner, New York, in his honor, Oct. 29.

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Dr. Michael I. Pupin, Columbia university, New York, has been awarded the John Fritz gold medal for 1932 by the unanimous consent of board members of four national societies of civil, mining and metallurgical, mechanical and electrical engineers for has achievements as scientist, engineer and inventor.

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S. T. McCall, former vice president, American Manganese Steel Co., Chicago, has been made vice president in charge of the finance department of the American Brake Shoe & Foundry Co., Chicago. His headquarters will be at the New York office of the company, 230 Park avenue.

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J. G. Llewellyn, assistant sales manager, Bell & Howell Co., Chicago, manufacturer of professional and amateur motion picture making equipment, has been made sales manager. Mr. Llewellyn, acting sales manager the past year, for 11 years was with A. M. Castle & Co., Chicago.

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David Austin, recently assistant district manager at Cincinnati for Carnegie Steel Co., Pittsburgh, has been appointed manager. Wilbur G. Somes, formerly connected with the Detroit office of the company, has succeeded Mr. Austin as assistant manager. Mr. Austin succeeds George H. Vant, former manager who died at Indianapolis, Sept. 15, following an accident.

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Radcliffe Denniston, one of the founders and vice president of the Clum Mfg. Co., Milwaukee, maker of automobile switches and other equipment and accessories for automobiles, trucks and tractors, and Spencer A. Pease, secretary and sales manager of the company, have resigned and organized the United Sales Co., Plankinton building, Milwaukee, distributor of automotive parts.

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John Fielding Jr. has become associated with Union Collieries Co., Pittsburgh, as manager of by-product and gas coal sales. For many years he was in charge of mining and purchasing product, gas producer and steam coals for Corrigan, McKinney Steel Co., Cleveland, and in 1929 became assistant to the president, Butler Consolidated Coal Co. He will continue to make his headquarters in Cleveland.

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L. U. Murray, district manager, industrial department, east central district, General Electric Co., Schenectady, N. Y., with headquarters at Cleveland, has been appointed manager of the Graybar-Western Electric department with headquarters in Schenectady. Mr. Murray succeeds R. S. Johnston, deceased.

J. P. Jones, manager machinery manufacturers section, industrial department, Schenectady, has been appointed district manager of the industrial department, east central district, to succeed Mr. Murray. J. J. Huether has been appointed to succeed Mr. Jones as manager of the machinery manufacturers section, industrial department.

# Obituaries

SAMUEL MATHER, 80, whose death occurred at Cleveland, Oct. 18 and whose funeral was conducted there Oct. 21, was a pioneer in the development of the early iron ore industry, one of the founders of Pickands, Mather & Co., and through numerous connections, in close affiliation with the steel industry from its early beginnings to the present.

Following his education in Cleveland public schools and at St. Mark's school, Southborough, Mass., Mr. Mather became interested early in his life in the initial activities of the Cleveland Iron Mining Co., which his father, Samuel L. Mather, had established in 1852. In 1882, when the younger Mr. Mather had returned from Europe, he, in affiliation with James Pickands and J. C. Morse, formed Pickands, Mather & Co.

This firm, in addition to being heavily interested in northern Michigan and eastern Wisconsin ore mines, also entered the Mesabi field in Minnesota. It has been one of the most important interests operating in the Lake Superior region and was one of the first of the large ore companies to acquire properties in the development days of the Marquette and Gogebic ranges.

In addition to being miners and dealers in iron ore and coal, the company meanwhile had begun the manufacture of pig iron and had become manager of a number of subsidiary lake steamship lines and dock fueling concerns, besides entering into contracts with important railroads to operate their Lake Erie docks as stevedores for the ore carriers.

In those early formative days of the company, Mr. Mather had about him as associates Henry G. Dalton, who was the company's first office boy and now is one of its partners; William McLauchlan, its first pig iron salesman; Harry Coulby, who for many years was the head of its vessel department and a partner; and later Henry S. and James M. Pickands, sons of James Pickands. All of these, except Mr. Dalton, have died. The remaining partners in the firm, besides Mr. Dalton, now are Elton Hoyt II, Samuel E. Bool and Frank Armstrong.

Mr. Mather took a prominent part in the formation of the Federal Steel Co. and was a director in this company, which preceded the larger merger now constituting the United States Steel Corp. In this connection he was active in the formation of the Steel corporation, and was elected to its board of directors in 1908, which office he held until his death.

During all this time Mr. Mather personally directed the grouping together of the widely-extended interests of Pickands, Mather & Co. One after another of the large mines and iron ore deposits was acquired, either outright by the company or in association with iron and steel manufacturing companies. Besides those mines which it owned or controlled, the company operated mines for others.

In this way, under Mr. Mather's direction, it built up the second largest mining company in the Lake Superior district, owning, controlling and operating about 32 properties, situated on the six principal ranges. The mines have capacity for producing 15,000,000 tons of ore annually, and normally employ 5000 miners.

While a student in a preparatory school, and visiting his father's mines, Mr. Mather was injured near Ishpeming, Mich., by a premature explosion of blasting powder. His left arm and spinal column were affected for the remainder of his life, but none but his

intimate frends knew of this affliction. Later he became a pioneer in mine safety work, his company havng been awarded several national safety trophies. He until recently visited practically all his mines every year. He was a brother of William G. Mather, president, Corrigan, McKinney Steel Co., Cleveland, another outstanding figure in the history of Lake Superior iron ore mine development, and whose company, Cleveland-Cliffs Iron Co., owns or controls many mines in Michigan and Minnesota. Samuel Mather's son, S. Livingston Mather, is vice president of the Cleveland-Cliffs company.

If his company were to operate mines for other consumers, Mr. Mather decided, it had to provide the means for carrying the ore to lower lake ports, and consequently a fleet of 49 vessels, the second largest on the Great Lakes, was gradually brought under the flag of the Interlake Steamship Co., a Pickands, Mather subsidiary.

The operating company and the fleet numbered among its most important customers Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. Some southern coal mines were acquired, but the company never went as heavily into this department as in iron ore. At the time of Mr. Mather's death, the company controlled only one large coal mine, in West Virginia.

Two years ago the company's various blast furnaces at Toledo, O., Erie, Pa., Duluth and Chicago were consolidated under the management of the Interlake Iron Corp.

Mr. Mather's associations with the steel industry were manifold, having financial interests in many of the steel companies as well as acting in directorship capacities at various times. In May, 1931, he resigned as a director of the American Iron and Steel institute, to be made an honorary vice president. As director he was succeeded by Mr. Dalton.

The charitable gifts of Mr. Mather to the Community Fund, Lakeside hospital, Western Reserve university, all of Cleveland, have exceeded $8,000,000.

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THOMAS A. EDISON, who died Oct. 18 at West Orange, N. J., at the age of 84 years, at one time appeared destined to play a big role in the iron ore industry, only to be thwarted by the development of the Mesabi range in Minnesota.

Early in his career of invention and discovery, Mr. Edison conceived the idea of a magnetic ore separator. In 1880, as he was about to mature this idea, he was interrupted by the application of the electric motor to the traction field.

In 1891 he again concentrated on the magnetic separation of ore and for the ensuing ten years devoted much time and money to an iron ore crushing and separating plant in the hills of western New Jersey. He developed giant rolls for smashing huge masses of magnetic ore rock, 3-high rolls for crushing, magnets for separating the particles of iron from the worthless gangue, and equipment for manufacturing iron ore briquettes.

Mr. Edison acquired 16,000 acres of magnetic ore deposits in New Jersey, at one time having more than 200,000,000 tons of such ore to treat. But at the zenith of his ore preparation career came the discovery of the rich bessemer ore in the Mesabi range, centering the development of the steel industry in the Middle West and robbing Mr. Edison of the fruits of his campaign. In later years, Mr. Edison believed that the exhaustion of high grade Lake Superior iron ores would ultimately revive his method.

Mr. Edison on Sept. 12, 1929, was made an honorary member of the American Society for Steel Treating. One of his early asistants at Menlo Park was Edward G. Acheson, the originator of carborundum.

**Samuel Mather**

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Robert Wise, 54, president and treasurer, Buckeye Products Co., foundry supply manufacturer, Cincinnati, died Oct. 6, at Cincinnati.

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Charles L. Heiser, 69, Cincinnati, locomotive, pumping designer and engineer, General Electric Co., Schenectady, N. Y., died Oct. 13 at Rock City Falls, N. Y.

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George M. Trefts, 81, president, Farrar & Trefts, Buffalo, died at Hamburg, N. Y., Oct. 18. Mr. Trefts succeeded his father in 1900 as president of the company, maker of boilers, engines and castings.

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John S. Cox, 78, former chief engineer, Lackawanna Steel Co., Buffalo, died recently. He also had held executive positions with the New York State Steel Co., Buffalo, and Bethlehem Steel Co., Bethlehem, Pa.

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Lee W. Barber, 55, president, Standard Car Truck Co., Chicago, died Oct. 18 at Monrovia, Calif. Mr. Barber had been with the Standard company for 35 years, and was active in the business until a month ago.

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H. C. Torrance, formerly Pittsburgh representative for Industrial Brownhoist Corp., Bay City, Mich., died in Pittsburgh, Oct. 19. He was born in Scotland and went to Pittsburgh after his graduation from college, being employed as chemist by the Carnegie Steel Co. Mr. Torrance retired six years ago.

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Maurice Kane, 83, former general manager, experimental department, International Harvester Co., Chicago, died Oct. 17, in Chicago. A native of Ireland, Mr. Kane came to this country as a youth and began work for the old Champion Reaper Works, later taken over by International Harvester Co. He retired several years ago.

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Francis Gordon Hall, who resigned as general sales manager of Central Iron & Steel Co., Harrisburg, Pa., about 10 years ago, to become vice president of the Commonwealth Trust Co., Harrisburg, died at his summer home, Bowmansdale, Pa., on Sept. 13. Mr. Hall was a leading citizen of Harrisburg and served as president of the Harrisburg chamber of commerce. During the war he was a member of the steel distribution committee of the war industries board.

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W. Shives Fisher, 77, former president Canadian Manufacturers' association, died at St. John, N. B., Oct. 15. He began his business career in St. John, where in partnership with the late R. B. Emerson he established the firm of Emerson & Fisher Ltd. He later organized the Enterprise Foundry Co., Sackville, N. B., of which he became president. He was also president, St. John Hardware association and a director, New Brunswick Power Co. During the war he was commissioner in charge of the Dominion Rifle Factory, Quebec, Que.

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Dr. Samuel W. Stratton, 70, founder and former director, bureau of standards, Washington, and later president, Massachusetts Institute of Technology, Cambridge, Mass., died Oct. 18 at Boston. He studied mechanical engineering at University of Illinois, later organizing its department of electrical engineering and in 1900 interested the government in establishing a bureau of standards, which was adopted by congress in 1901. Dr. Stratton became its head, retaining the post until 1923, when he became president of M. I. T.

# MIRRORS of MOTORDOM

*DETROIT*

FORD MOTOR CO., like the rest of motordom, continues to produce 1931 models in restricted number, but gradually the inpenetrable veil of secrecy over its 1932 models is lifting.

It has now been conclusively proved that Ford has issued sheet steel sizes for his 1932 job. Several mills have received their new orders—but not yet releases—for body and quarter-panel stock.

Further established as a certainty is the gasoline tank in the rear, a longer wheelbase by 3 inches, a heavier body, the motor still a four.

Though not in line in fact but in principle with Plymouth's floating power device, Ford is incorporating a vibrationless feature which centers chiefly around a heavier crankshaft, reported to be an 8-bearing 90-pound one, which would involve double bearings between throws.

Until production is started on this car, Ford is going ahead with Model A in reduced numbers. No steel orders have been placed with outside mills since the one three weeks ago that called for 40,000 odd-jobs.

## Hudson Making 1932 Units

As matters stand now, the Ford tentative body schedule is 90,000 more units before Jan. 1, 1932; 300,000 units for the first quarter, 1932; 500,000 units for the first half, 1932.

Just at what point in this schedule the new Ford breaks in still is a matter of conjecture, even at Ford's, though probably sometime around Thanksgiving.

The 10 Ford open-hearth steel furnaces still are cold, down since June 28. One blast furnace is on. The stock of cold pig iron is reported to be about 250,000 tons.

The bank of motors at Dearborn has been steadily decreased over the past six weeks.

Chevrolet now, as in late 1930, is going ahead with its coming year's plans regardless of competitive or other outside influences, setting a production schedule and adhering to it.

Just at the transition stage for the 1932 line, Chevrolet 1931 assembly tapered markedly last week. The Chevrolet Saginaw, Mich., foundry resumed last week after being closed half of September. About 2500 employes were called back to work 4 and 5 days a week on new engine blocks and castings.

At this time, virtually the only Detroit automobile producer going ahead on its new car is Hudson-Essex. While the rest are sitting tight, minds made up, with production schedules ready to snap when they deem the time propitious, Hudson-Essex is aiming at a Nov. 15 introduction of new models, and consequently its plant is showing signs of activity. Incidentally, this new model of Hudson's will incorporate a one-piece fender.

## Chrysler Assembly Closed

Taking a rest until Nov. 1 are Chrysler, Dodge and DeSoto. While assembly lines are not scheduled, other departments are operating in desultory fashion. Plymouth is the only Chrysler subsidiary doing any production of finished cars, and at a reduced rate from its record in August.

The 1932 Graham will have a patented device to set its bodies lower, yet in an original manufacturing method. The frame is made in shape very similar to a steel structural shape channel. Instead of arching the frame over the axle, the web of the channel has been slit for fore and back axle, pulled apart by a difficult fabricating process, then the axles are inserted through the slot.

Hupp is busy rearranging some of its divisions, setting up the assembly of bodies in Cleveland, the assembly of all parts into the finished six's and eights in Detroit. Murray Body lost part of its body contract to Heintz Mfg. Co., Philadelphia, which under the new setup is to make sedan stampings. Mullins Mfg. Co. continues to make coupes and other closed job sheet stampings.

Murray, incidentally, had not started production up to late last week in its new frame plant adjoining Great Lakes Steel Corp. at Ecorse. Workmen were busy putting the finishing touches on the plant. The new structure, put up in six weeks, has been made to adjoin an old stamping plant formerly known as Michigan Stamping Co., and at one time occupied by Parish & Bingham, makers of Ford frames in the early days.

## New Models Rule Gossip

Hudson-Essex and employes gave $50,000 to the Detroit community fund last week. . . . National Steel Corp. common stock is now listed on the Detroit exchange. . . . Take them for what they are worth but the latest crop of unverified rumors run to this effect: That Pierce-Arrow will move to Detroit, occupying Studebaker's old No. 2 plant, West Jefferson avenue; that the new low-price car Studebaker will back, to be assembled in its No. 1 Detroit plant adjoining the Michigan Central tracks, is to be known as the "Rockne"; that Plymouth plans to bring out some revisions for the 1932 shows, just to be consistent with the rest of motordom; that A. O. Smith Corp. made a strong bid for the Buick frame contract this year but lost it to the regular source of supply; that a few months from now the public will be treated to the greatest display of "dressed-up," revised models as they have never before seen; that Chevrolet has a front-wheel drive, four-cylinder model being experimented on with an eye to future production as a possibility; that no one of 1931 will recognize the new Buick of 1932; that Nash and Auburn are figuring on low-priced cars.

# EDITORIAL

## Rate Verdict Disappointing, But Leaves Door Open

AS LONG as the interstate commerce commission's freight rate decision hung in suspense, the business world entertained hope that the long awaited verdict would at least clarify the railroad situation, if not measurably relieve it. But at the time of this writing—72 hours after the commission's answer was made public—authorities representing the roads, shippers and investors still are in doubt as to its probable effect.

Railroad executives speak guardedly, but they cannot hide their bitter disappointment. Investors are puzzled as to what benefit they will reap. Shippers, in which category the steel industry is an important faction, are divided in their opinion.

Before condemning the federal regulatory body arbitrarily it is well to consider the circumstances under which the case was submitted. Unable to help themselves to the extent required under present conditions, the carriers asked the commission for an increase in rates. The federal body had several alternatives. It could grant the request in full, in which case it would have been severely criticized for blindly ignoring the present general trend toward reductions in the costs of all commodities and services. It could refuse the plea, thus incurring the wrath of a nation which expects every agency to do its part in relieving the depression. As a third alternative, the commission could approve or deny—with qualifications or with a counter proposal.

### Commission, in Difficult Position, Offers Peculiar Pooling Arrangement

For reasons stated at the time the decision was announced the commission chose the third alternative. It denied the application for a flat 15 per cent increase and invited the roads to submit for its approval a conditional plan for limited increases. Permission to invoke the higher rates depends upon establishing before Dec. 1 a pooling plan by which the estimated $100,000,000 or more gross income derived from the increased rates would be placed in a common fund for distribution to carriers which fail to meet their interest charges, in proportion to their deficiencies. The increases, if approved, would be effective only until March 31, 1933.

Clearly a temporary expedient, the plan has the effect of helping poorly managed roads with funds earned by well managed carriers. Yet this frankly socialistic aspect of the proposal has the doubtful merit of partially guaranteeing financially weak companies against bankruptcy. To that extent it meets the demands of investors who have been worried by the sad state of railroad securities. But it hardly goes far enough to assure restored dividends.

The railroads on Friday indicated they would accept the commission's plan "in principle," on condition that the pool be administered by the carriers and not a federal agency, that the funds from the pool be advanced to weaker roads as loans and not outright gifts and that roads accepting the loans will not pay dividends.

### Inadequacy of I.C.C. Relief Is Sure To Lead To Wage Question

As the matter now stands, the commission and the carriers are inclined to help the weaker roads, but the amount of assistance is limited to one-quarter of that anticipated in the application for a 15 per cent increase in rates.

How the plan will affect the steel industry is an open question. It is certain the higher rates permitted under the commission's proposal will add considerably to the cost of producing iron and steel. If producers can pass this increment on to the consumer, no harm will be done. On the other hand, it is doubtful whether the pool will provide sufficient relief to enable railroads to purchase steel more freely.

Sooner or later the inadequacy of assistance provided in the decision will lead to the wage question, and herein is a promising path to tangible benefits. If the brotherhoods would come forward at this stage with a voluntary offer to accept reduced wages, their action would be hailed as a smart move. If they fail to do this, it is almost certain the roads—in fairness to their customers—will be forced to ask the unions to revise their wage agreements. In no other way can operating costs be brought into line quickly with the lower costs prevailing in other lines of activity.

The decision is disappointing in that it temporizes with an acute problem but it leaves the door open for action by the roads, the brotherhoods and the President of the United States, which may prove helpful.

# THE INDUSTRIAL DIAL

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The Business Trend Section of STEEL
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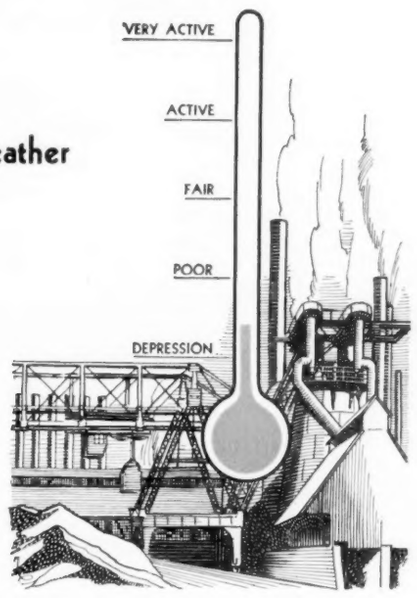
MONOTONY in the trends of the majority of business barometers makes current statistics singularly dull. About all that can be derived from the present record is that industrial activity has slowed down to a snail's pace, commodity prices are continuing their downward drift and these trends are likely to continue until public confidence is restored to a reasonable basis.

Fortunately corrective measures—some of them of extreme importance—have been announced with encouraging frequency. The American Legion agreed not to press for bonus payments. England abandoned the gold standard. The National Credit Corp. was organized.




From Vancouver came word that the American Federation of Labor had voted down the dole.

And within a fortnight the important visits of Laval and Grandi with President Hoover and perhaps reassuring action on railroad finances will join this parade of impressive factors of favorable import to business.

### United Action Assured

These events indicate that the country rapidly is working toward co-ordinated effort. The general realization that the nation was aimlessly drifting toward acute danger came none too soon. It is probable that the President's credit plan is only one of several co-operative activities that will be organized in the near future to lend aid to constructive work.

## Where Business Stands

**Monthly Average, 1930—100**

| | Sept., 1931 | Aug., 1931 | Sept., 1930 |
|---|---|---|---|
| Steel Ingot Output | 46.7 | 51.9 | 85.7 |
| Pig Iron Production | 43.9 | 47.8 | 88.1 |
| Freight Movement | 82.7 | 83.9 | 100.3 |
| Building Construction | 70.7 | 72.0 | 96.9 |
| Automobile Output | 47.9 | 65.1 | 78.2 |
| Wholesale Prices | 77.2 | 78.9 | 95.8 |

That the credit situation is the key to confidence now is clear to everyone. At home and in the field of international finance the problem of credits now is receiving the attention of the world's most capable experts. Once the difficult questions involved in international debts and in "frozen assets" in the United States yield to solution, rapid progress in re-establishing confidence will be made.

### Industry Awaits Return of Confidence

When this important operation on business has been performed successfully the patient should begin to show signs of recovery. Return of confidence would stimulate demand and an upturn in industrial activity would be followed by a stiffening of prices.

Steel ingot operations at 30 per cent of capacity or below, blast furnace production at 27 per cent and other industrial activity at corresponding rates cannot continue long. But improvement must await public confidence, which in turn rests on the credit situation.

## Business Trend Charts of the Month

**Production**

Steel ingot production ..... Oct. 12, p. 27
Pig iron production ..... Oct. 12, p. 28
Blast furnace production rate ..... Oct. 12, p. 28
Industrial production ..... Oct. 1, p. 28
Coke production ..... Oct. 19, p. 29
Bituminous coal output ..... Oct. 19, p. 28

**Demand**

Unfilled orders, U. S. Steel Corp. ..... Oct. 19, p. 30
Railroad car orders ..... Oct. 12, p. 29
Index of machine tool orders ..... Oct. 26, p. 29
Index of foundry equipment orders ..... Oct. 5, p. 30; Oct. 26, p. 30
Building construction ..... Oct. 26, p. 29
Steel castings, orders ..... Oct. 1, p. 30
Structural steel sales ..... Oct. 12, p. 29
Automobile production ..... Oct. 5, p. 28
Steel sheets, orders ..... Oct. 1, p. 30
Refined copper, stocks, etc. ..... Oct. 5, p. 29

**Prices**

Bradstreet's index of commodity prices ..... Oct. 19, p. 27
Iron and steel price index ..... Oct. 19, p. 30
Basic pig iron—heavy melting steel ..... Oct. 19, p. 28
Iron and steel parity ..... Oct. 5, p. 29
Building cost index ..... Oct. 5, p. 30

**Miscellaneous**

Foreign trade ..... Oct. 26, p. 30
Freight traffic ..... Oct. 1, p. 29
Commercial failures ..... Oct. 19, p. 29
Iron and steel imports and exports ..... Oct. 1, p. 29

# Thumb Nail Sketches Of Business

**Few Gains in September**

In September nine of 15 important business barometers showed unfavorable trends, four were favorable in character and two were neutral. Declines were noted in volume of freight traffic, automobile output, steel ingot production, pig iron output, car orders, unfilled steel bookings, machine tool orders and Bradstreet's commodity price index. Also the copper situation was worse instead of better. On the other hand commercial failures were fewer in number, coal production increased, foreign trade gained and orders for foundry equipment were up. The volume of building construction was down slightly, but measured in dollars, a slight gain was registered. Iron and steel prices were down slightly, according to STEEL's composite, but the general price structure was steady.

**Profitable Policies**

As depressed conditions continue, the limelight of publicity is being focused more and more upon companies which are showing greater profits in 1931 than in 1930. Several newspapers are featuring stories on successful industrial concerns and a number of class publications are pointing to the experience of prosperous companies. A casual examination of the evidence offered from these sources seemed to indicate that the policy most frequently mentioned as essential to profits is one based on sound marketing practice. Knowledge of markets, intelligent selling and the proper use of advertising seem to be fundamental. A detailed study of the policies of successful companies in this period would be enlightening.

**Agriculture**

In general crop conditions improved in September. The yields of corn and spring wheat as estimated by the department of agriculture were reduced from earlier predicted figures, but the totals expected still are above last year's yield.

**Employment**

The trend of employment is not clearly defined. In Illinois employment in September declined 6.7 per cent—the most severe recession since last June. On the other hand factory employment in the state of New York improved in September 2.7 per cent. The gain in New York city was 4.4 per cent due largely to seasonal activity in the manufacture of clothing, jewelry, and food products. Reports from other sections are mixed, with indications that the tendency is generally unfavorable.

**Copper Stocks**

Production of refined copper in September was at low ebb, but shipments were likewise in diminished volume with the result that the already top heavy stocks were increased to the extent of 24,121 tons. The backlog of stores of refined copper in North and South America now stands at 479,896 tons—the largest stock recorded in the history of the copper industry.

**Industrials Improve Liquid Position**

Indicative of the extent to which industrial companies are husbanding their resources is the report issued by Ernst & Ernst showing a comparison of balance sheets for mid-year 1931 with those of the previous year. In the aggregate, the 162 companies whose statements were studied, raised their composite ratio of current assets to current liabilities from 5.49 to 1 as of June 30, 1930, to 6.93 to 1 as of June 30, 1931.

# The Barometer of Business

## Industrial Indicators

| | Sept., 1931 | Aug., 1931 | Sept., 1930 |
|---|---|---|---|
| Pig iron output (Daily average, tons) | 38,821 | 41,264 | 75,893 |
| Machine Tool Index | 63.1 | 68.9 | 113.6 |
| Unfilled orders (tons) | 3,144,833 | 3,169,457 | 3,424,338 |
| Ingot output (Daily average, tons) | 59,523 | 66,133 | 109,245 |
| Dodge Bldg., awards in 37 states (sq. ft.) | 30,068,100 | 30,631,200 | 41,193,300 |
| Automobile output | 140,000* | 191,741 | 228,606 |
| Coal output, tons | 31,806,000 | 30,517,000 | 38,632,000 |
| Business failures, number | 1,936 | 1,944 | 1,963 |
| Business failures; liabilities | $47,255,650 | $53,025,132 | $46,947,021 |
| Cement production, Bbls. | 12,092,000 | 13,549,000 | 16,124,000 |
| Cotton consumption, bales | 463,704 | 425,819 | 394,321 |
| Car loadings (weekly average) | 726,988 | 749,457 | 931,422 |

*Estimated.

## Financial Indicators

| | Sept., 1931 | Aug., 1931 | Sept., 1930 |
|---|---|---|---|
| 25 Industrial stocks | $156.80 | $190.54 | $219.73 |
| 25 Rail stocks | $46.44 | 58.43 | 106.55 |
| 40 Bonds | $77.57 | 81.73 | 88.49 |
| Bank clearings (000 omitted) | $30,709,656 | $28,907,922 | $39,830,271 |
| Commercial paper rate, N. Y. (per cent) | 2 | 2 | 3 |
| *Commercial loans (000 omitted) | $7,867,000 | $7,845,000 | $8,446,000 |
| Federal Reserve ratio, per cent | 79.4 | 83.9 | 80.8 |
| Railroad earnings | $55,858,736 | $56,534,903 | $95,603,922 |
| Stock sales, N. Y. stock exchange | 51,140,000 | 24,890,277 | 53,545,145 |
| Bond sales, par value | $318,310,000 | $188,645,350 | $226,411,100 |

*Leading member banks Federal Reserve System.
**August, July and August, respectively.

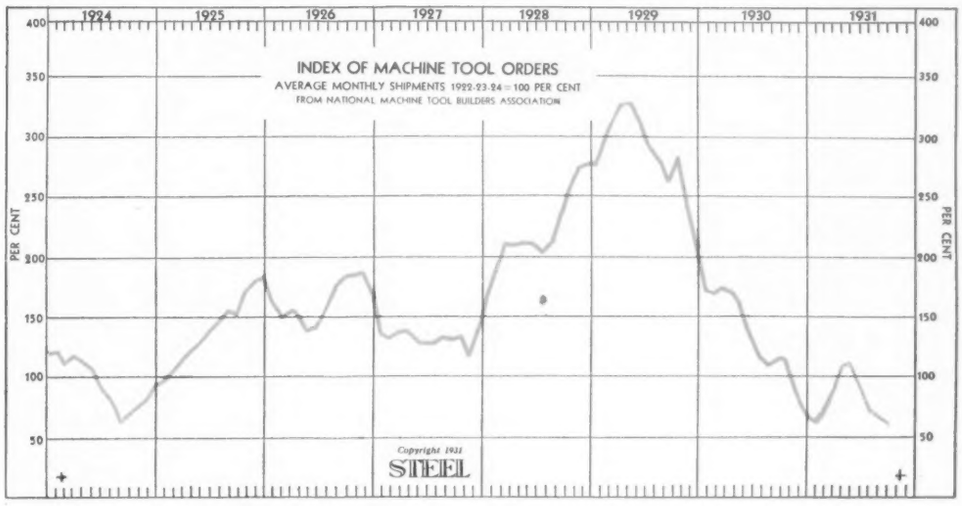
## Foreign Trade

| | Sept., 1931 | Aug., 1931 | Sept., 1930 |
|---|---|---|---|
| Exports | $181,000,000 | $165,000,000 | $312,207,000 |
| Imports | 171,000,000 | 166,000,000 | 226,352,000 |
| Gold exports | 28,708,000 | 39,000 | 11,133,000 |
| Gold imports | 49,240,000 | 57,539,000 | 13,680,000 |

## Commodity Prices

| | Sept., 1931 | Aug., 1931 | Sept., 1930 | Monthly average 1913 |
|---|---|---|---|---|
| STEEL's composite average of 14 iron and steel prices | $31.03 | $31.05 | $32.65 | $26.32 |
| Bradstreet's index | $8.30 | $8.49 | $10.30 | ..... |
| Wheat, cash (bushel) | 48c | 49c | $1.01 | 92c |
| Corn, cash (bushel) | 60c | 66c | $1.09 | 51c |
| Petroleum, crude (Bbl.) | 60c | 60c | $1.18 | $2.50 |

| | 1931 | 1930 |
|---|---|---|
| Sept. | 63.1 | 113.6 |
| August | 68.9 | 110.2 |
| July | 74.1 | 117.3 |
| June | 88.6 | 146.7 |
| May | 103.3 | 165.1 |
| April | 102.1 | 176.8 |
| March | 89.4 | 177.8 |

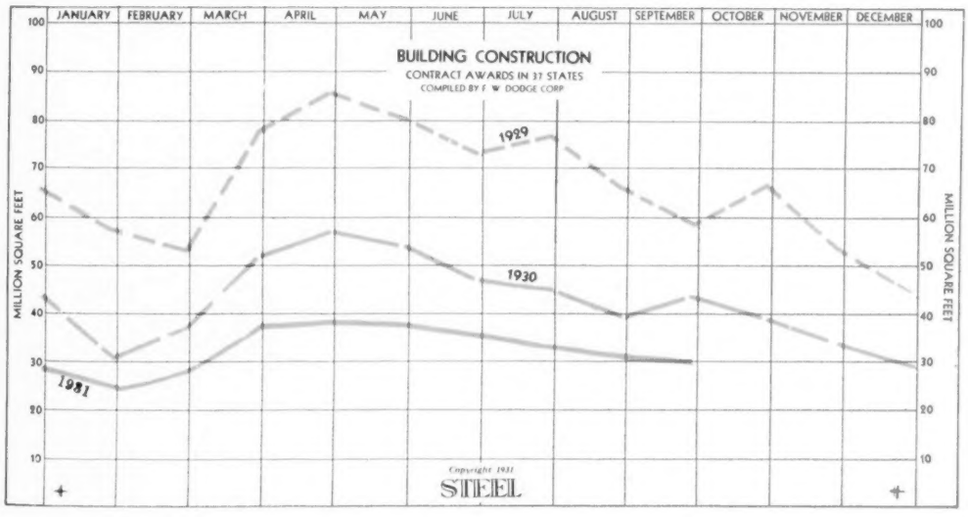



## Index of Machine Tool Orders Drops Lower in September

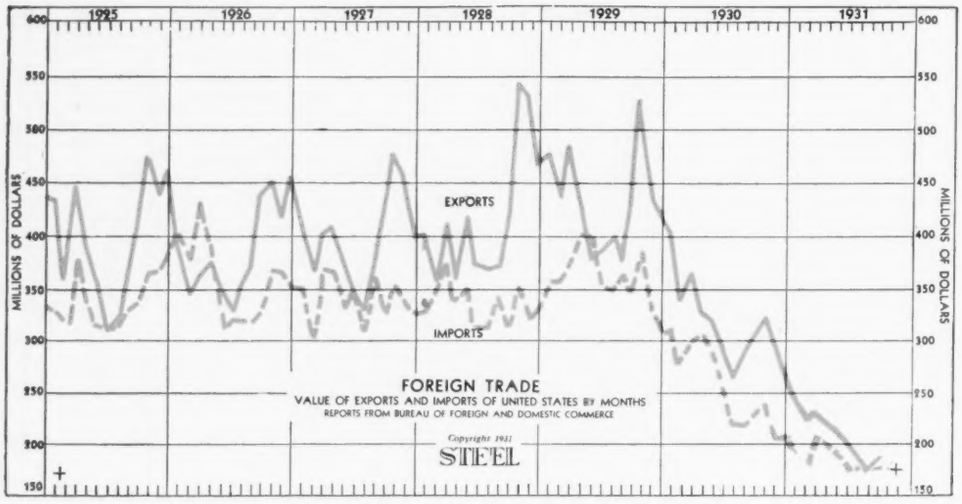
According to the compilation of the National Machine Tool Builders' association, the three months' moving index of gross orders for machine tools dropped from 68.9 in August to 63.1 in September. The three months' figure for September is the lowest on the present records, which date back to 1923. Actual orders dropped from 71.7 in August to 56.0 in September, a new low for the year. Among the three classes of companies reporting, declines took place with the large and small companies but a slight gain was marked up by the companies of medium size. Shipments dropped from 95.7 in August to 91.8 in September while unfilled orders dropped from 181.6 to 139.9.

## Volume of Building Construction Is Down, But Value of Awards Is Higher

Continued reduction in the cost of building materials is affecting the relationship between statistics based on money values and those based on physical volume. For instance the figures of the F. W. Dodge Corp. show a slight upturn in building awards in September—in point of value. However, when these contracts are reduced to square footage the total is slightly lower than the corresponding figure for the previous month. Awards in 37 eastern states involved 30,068,100 square feet in September as compared with 30,631,200 in August and 41,193,300 in September, 1930. Expected building construction in the year dating from Oct. 1, 1931, amounts to $4,000,000,000.




| | Square Feet |
|---|---|
| Sept., 1931 | 30,068,100 |
| Aug., 1931 | 30,631,200 |
| Sept., 1930 | 41,193,300 |




**EXPORTS**

| | |
|---|---|
| Sept., 1931 | $181,000,000 |
| Aug., 1931 | 165,000,000 |
| Sept., 1930 | 312,207,000 |

**IMPORTS**

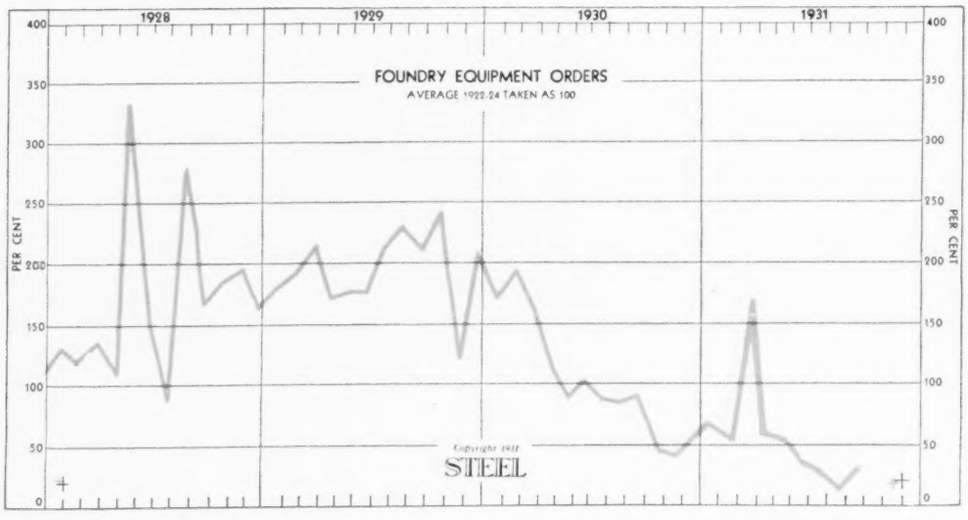
| | |
|---|---|
| Sept., 1931 | $171,000,000 |
| Aug., 1931 | 166,000,000 |
| Sept., 1930 | 226,352,000 |

## Exports and Imports Rise, Restoring Favorable Trade Balance

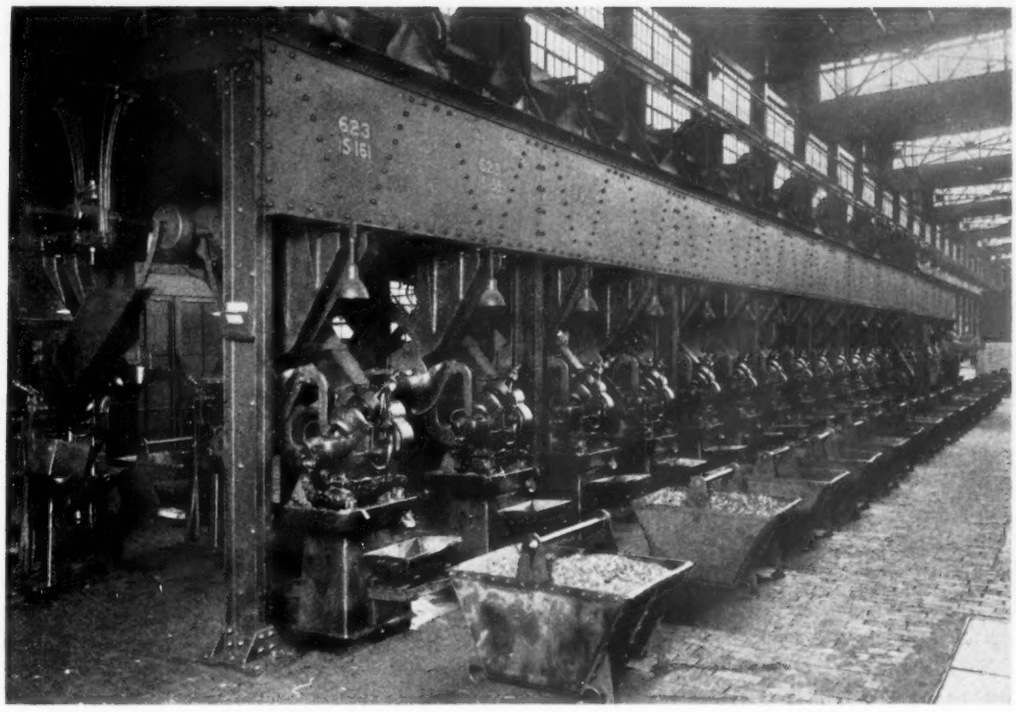
Thanks to larger shipments of goods and textile products to foreign countries, the unfavorable balance of American foreign trade in August was wiped out in September. Exports mounted from $165,000,000 in August to $181,000,000 in September and imports jumped from $166,000,000 to $171,000,000. This established a favorable balance of $223,000,000 for the first nine months compared with slightly more than half a billion dollars in the same period last year. The excess of imports over exports in August was the first unfavorable trade balance since April, 1926. Cotton exports to Germany and the Orient were largely responsible for restoring the favorable balance.

## Foundry Equipment Orders Gain After Steady Decline Since March

After declining steadily since last March, foundry equipment orders in September turned upward. According to the report of the Foundry Equipment Manufacturers' association the index of net orders was 31.9, compared with the extremely low figure of 16.9 in August and with 91.0 in September last year. The index of shipments was 29.6 against 37.4 in August and 66.0 in September, 1930. With the exception of March, 1930, when a sharp rise to 174.4 was registered, the orders index has been well below 100 since June, 1930. The highest point attained in recent years was in May, 1928, when the index was above 300. The index is subject to sharp fluctuation.




| | 1931 | 1930 |
|---|---|---|
| Sept., | 31.9 | 91.0 |
| Aug. | 16.9 | 85.2 |
| July | 38.7 | 90.6 |
| June | 40.9 | 102.1 |
| May | 54.1 | 92.7 |
| April | 57.7 | 122.8 |



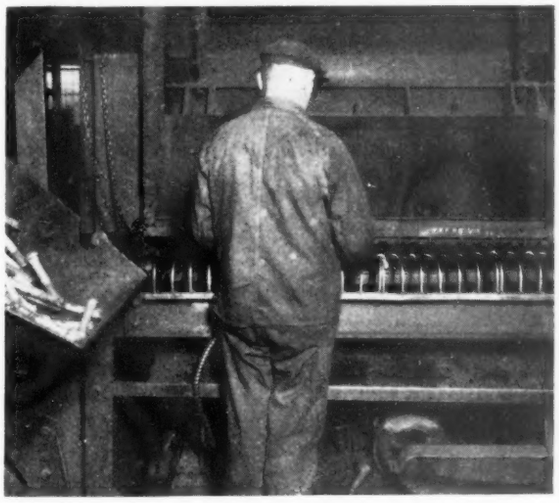
*PART of a battery of automatic nut tapping machines. The entire battery is capable of tapping 1,500,000 nuts per day*

# New Uses for Bolts Demand Higher Standards of Manufacture

BY F. O. KICHLINE, Engineer of Tests
Lebanon Plant, Bethlehem Steel Co.

EACH step in modern engineering and industrial progress affects all its related fields. A special chemical retort, for example, demands steel of individual specifications. A new type of window trim may be feasible only because of noncorrosive metal. In virtually all of these developments, the connecting members, that is the bolts and nuts, must measure up to the needs of the entire product. Hence the demands of gasoline production, improved railway trackage, chemical progress, electrification, and the myriad other improvements of the last decade have called for new higher standards in bolt manufacture, and for progress in the problem of steelmaking.

It would be exaggerating to say that the new demands made upon bolts have been the sole or chief influence affecting the metallurgy of steel production. But modern demands and improved metallurgy have been inter-related in their progress. The control of steel composition and qualities, made possible through metallurgy, is being utilized to the full in the making of bolts, and has ramifications which laymen, or even men outside of that particular division of the industry, barely realize. Bolts often are located at points of greatest strain, where failures in service may have disastrous consequences. The heat treating of bolts to obtain strength, and to resist high pressures and high temperatures, has been an inevitable development to meet modern requirements. The choice of the steel going into



*Charging large bolts into the rack of the continuous electric annealing furnace. The bolts are separated by the rack to insure more uniform heat treatment*

*South bay of main warehouse where orders are assembled for shipment. Sufficient floor space is available for assembling 60 carloads of material at one time*

the product is, of course, as important as the process of heat treating.

In considering the steps which have been taken to improve the quality of bolts and nuts, it is worthwhile first to outline certain of the uses to which these products are put in modern industry.

### Railroad Demand Was First

Logically enough, the first demand for heat treated bolts came from the railway field, where track bolts are subjected to a great deal of heavy use and abuse. Sagging roadbeds causing undue strain at joints, the continuous daily pounding, and the strain in drawing nuts up tight on the splice bars were common causes of failure, and such failure was always potentially a serious matter. Higher speeds and heavier wheel loads have necessitated higher requirements, until now virtually all track bolts are heat treated.

Another commercial demand of the day is for bolts to resist high pressures. In power plant practice some boilers are designed to operate at 1400 pounds, and there is good reason to anticipate that pressures as high as 2000 pounds may become commonplace in the near future. In Europe, a boiler in an experimental installation is being operated at 3200 pounds pressure.

Modern cracking processes used by oil refineries also develop not only high pressures but high operating temperatures. At present the commercial aim is for materials that will stand up satisfactorily at a temperature of 1000 degrees Fahr. Already steel compositions are available that are serviceable at 2100 degrees Fahr. under certain conditions.

In the chemical field the quality of resistance to corrosive action is also particularly important, as in any field where high temperature and corrosive action are factors. For example, sulphur gases encountered in combustion chambers require the use of high-temperature high-pressure steels, which have the additional quality of being unaffected by sulphur gas.

### Creep Tests Important

Another point which the steel manufacturer watches in steels used for high-temperature purposes is the factor of creep. Steels submitted to stresses at high temperatures continue to expand beyond the initial elastic extension which occurs when load is applied. This slow and continuous extension increases with the stress and temperature to which the material is subjected. The permissible amount of creep is a variable that is governed by the purpose for which the material is being used. In a high-pressure steam line, for example, the allowable creep would be small, whereas an extension of 2 to 3 per cent in ten years might introduce no element of danger in the case of a pressure vessel.

The required characteristics of bolts in modern usage may be summarized then as follows:

1. Track and certain other bolts: Great strength at normal temperatures.

2. For high-pressure purposes: Material must maintain strength continuously at high temperatures; the coefficient of expansion should be

**Table I**

## Physical Properties of Three Special-Purpose Bolt Steels

| Type of steel | Ultimate strength Pounds per square inch | Yield point Pounds per square inch | Elongation, per cent | Reduction of area per cent | Brinell hardness | Fatigue test, per cent |
|---|---|---|---|---|---|---|
| Low-carbon nickel-chromium* | | | | | | |
| Bars quenched from 1600 and drawn at 1300 degrees Fahr. | 88,600 | 69,000 | 29 | 79 | ..... | R=58.0 |
| Low-carbon chromium corrosion-resisting† | | | | | | |
| Annealed | 110,000 | 97,000 | 22 | 68 | 229 | ..... |
| Maximum with heat treatment | 183,000 | 148,000 | 17 | 57 | 388 | ..... |
| High-chromium heat-resisting‡ | 95,000 | 50,000 | 18 | 22 | 187 | ..... |

*This composition is useful for bolts and studs where high ductility and ability to withstand shocks are desired. High resistance to both fatigue and shock are present.

†Because of its low carbon content this material is sometimes designated as an iron. It is capable of heat treatment by oil hardening from 1750 degrees Fahr. and drawing back to the desired hardness. In either the annealed or heat treated condition it is resistant to atmospheric and water corrosion and mild chemical attack. To obtain maximum corrosion-resisting properties all scale must be removed by pickling, while articles with ground or polished surfaces will have the highest passivity to attack.

‡Primarily a heat-resisting material, this steel will withstand temperatures up to 1800 degrees Fahr. It is austenitic in character and will not harden appreciably by heat treatment. Annealing is accomplished by heating to a temperature above 1750 degrees Fahr. This steel may be hardened by cold working and resists the action of ordinary agents of corrosion and nitric acids; also has high resistance to scale at temperatures up to 2100 degrees Fahr. on short-time tensile tests.

low; creep must be tested and allowed for; corrosion-resistance is important; greater ductility is required than for normal uses; resistance to abrasive action is a factor in certain classes of work; and ability to withstand effects of shock and fatigue is essential.

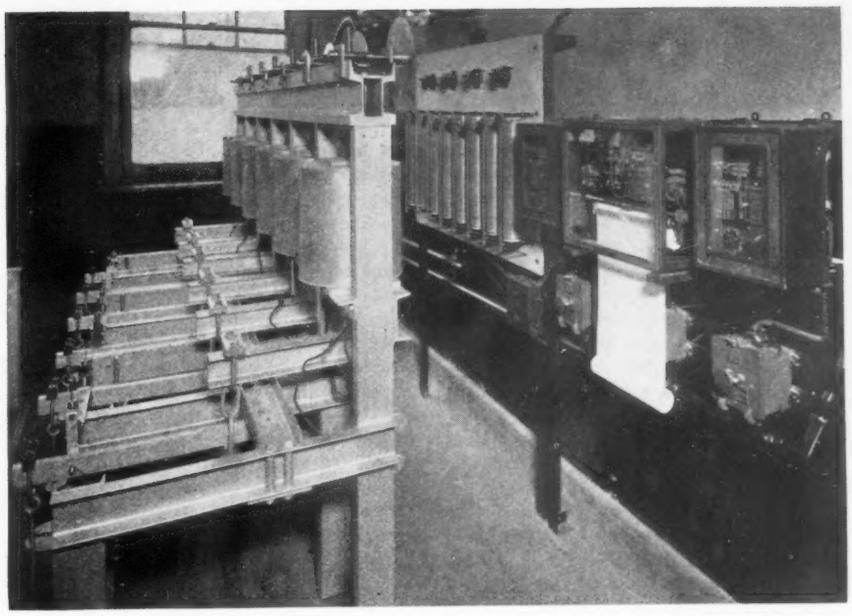
Thus it is evident that the problem of furnishing bolts suitable for any given purpose usually involves much more than simply specifying a heat treatment and then seeing that the methods of production are such that the product will meet uniformly the requirements of the specifications. Tensile strength, often quoted as a basis of comparison, does not of itself tell the whole story, for ductility and other properties must be considered.

### Elaborate Equipment Involved

These diverse demands and exacting specifications of modern industry have called for elaborate up-to-date equipment on the part of the manufacturer. The Lebanon plant of the Bethlehem Steel Co., Lebanon, Pa., is an example of the extent to which the steel industry has gone to satisfy present day demands. The heat treating department for bolts and nuts houses three automatic-type electric heat treating furnaces, each capable of handling 2000 pounds per hour, and two gas-fired furnaces with capacities of 1200 pounds per hour. Quenching tanks, circulating and cooling pumps, conveyors and other auxiliaries complete the main layout. In addition, two electric furnaces for drawing recently have been installed.

The automatic-type electric furnaces are used for large-scale production orders, while the gas-fired furnaces are for miscellaneous lots which, however, need individual treatment.

Temperature control in the heating furnace, quench tanks and drawing furnace is by means of sets of thermocouples in each.



*High-temperature creep test apparatus set up in the main laboratory of the plant. Specimens under test are enclosed by the six cylindrical heating units*

The hearth plate, which moves in and out automatically, has grooves which keep the bolts separated for more uniform heating. There are from 24 to 36 of these grooves, depending upon the size of bolts being handled. Bolts are placed in the grooves with the heads facing out. As the hearth plate moves in, the heads of individual bolts pass under hinged fingers, which lift to permit the entrance of the bolts, but prevent their return when the hearth plate moves back to the starting position. The bolts thus work gradually forward as other bolts are pushed in behind them, until they finally drop one by one into the quenching bath.

Oil is used more commonly than water as a quenching medium in this operation. An electric agitating pump operates a water cooler for the purpose of keeping the bath temperature constant. The time in the quenching bath is governed by the use of three-speed conveyor chains which provide a wide control range.

Except for the narrow slit at the front of the furnace, it is entirely enclosed so that the bolts are out of contact with the air from the time they enter the furnace until they pass out into the quenching medium. This reduces the probability of scaling or oxidation.

### Laboratory Checks Results

Adjacent to the heat treating plant is a checking laboratory, which takes frequent samples and tests them in accordance with the specifications and type of work on which they are to be used. The nuts for the bolts are, of course, manufactured and tested similarly. Two classes of nuts are made to show brinell hardnesses of from 120-200 and from 225-350, respectively. The strength developed on stripping tests will range from 130,000 to 180,000 pounds per square inch.

Back of the actual manufacture and heat treatment of the bolts is the fundamental requirement of the manufacture of steel. It is necessary for the maker of the steel to know the intended applications of the finished bolts in order that there may be the proper composition for the particular job. For example, a low-carbon nickel-chromium composition is useful for bolts and studs where high ductility and ability to withstand shocks are desired, as shown by data in table I.

A low-carbon chromium composi-

(*Concluded on Page 38*)

**Table II**

## Chrome-Tungsten Bolt Steel

| Testing temperature, degrees Fahr. | Ultimate Strength | Yield point | Elongation in 2 inches, per cent | Reduction in area per cent |
|---|---|---|---|---|
| | Pounds per square inch | | | |
| Room temperature | | | | |
| Minimum | 130,000 | 110,000 | 18 | 55 |
| Average | 132,000 | 120,000 | 21 | 61 |
| See Note { 800 | 120,000 | 110,000 | | |
| See Note { 900 | 110,000 | 100,000 | | |
| See Note { 1000 | 100,000 | 80,000 | | |
| See Note { 1100 | 85,000 | 60,000 | | |
| See Note { 1200 | 60,000 | 35,000 | | |

| Range, degrees Fahr. | Coefficient of linear expansion | Load, pounds per square inch | *Creep, inches per 2 inches |
|---|---|---|---|
| 100-500 | $7.5 \times 10^{-6}$ | 12,500 | 0.00504 |
| 500-900 | $7.7 \times 10^{-6}$ | 12,000 | 0.00236 |
| | | 11,800 | no creep |
| | | 11,000 | no creep |

Note—These specimens were quenched in oil and drawn at 1150 degrees Fahr; and then were held at testing temperature for 30 minutes before pulling.

*Creep tests were for 1000 hours duration, at a temperature of 1000 degrees Fahr.

# Refinements Give New Life To Bessemer Process

CHANGING conditions have put the bessemer process for steelmaking in a more favorable position than it occupied a few years ago and today bessemer steel retains its place for uses where it always has been pre-eminent and has replaced other steels in some of the newer uses. This observation was made before the fall meeting of the American Iron and Steel institute in New York, Oct. 23, by Richard S. McCaffery, professor of metallurgy, University of Wisconsin, Madison, Wis.

Reasons given by Prof. McCaffery for the improved position of the process are: Relatively larger bessemer ore reserves than formerly, in-

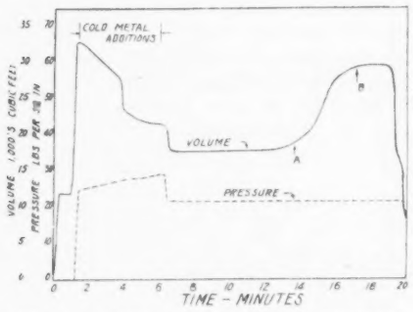



*Fig. 1—Blow maintaining constant pressure*

suring present operations for a considerable time; more knowledge of metallurgical chemistry; new instruments for process control; and new equipment for use in production.

The bessemer process, basically unchanged, differs in details from previous practice, new refinements tending toward uniformity of product and improvement in quality. The speaker described a converter blow, pointing out how certain modification from usual practice, for example, the control of silicon and of initial temperature, which avoids steaming or tilted blowing and which gives metal of proper finishing temperature, effect decided improvement in quality and uniformity.

During the first stage of a blow, oxygen of the air unites with the silicon, manganese and iron which are oxidized and the weight of the bath is increased by the added oxygen. During the carbon blow, however, the oxygen combining with the carbon goes off as a gas and the weight of the bath actually is decreased by its carbon content during the final stage.

Electrically-driven blowing equipment has been installed recently in one plant, each converter being provided with an individual motor-driven centrifugal blowing unit on an individual air line to the converter. Any blower can be connected with any converter with complete control on the blowing pulpit. The operator has a pressure gage, a volume meter and a tachometer in addition to the start, stop and speed regulation buttons, affording the most exact control ever realized.

Figs. 1 and 2 show curves of volume and pressure for two soft steel blows, one blow maintaining constant pressure after cold metal additions and the other maintaining constant volume for the same time. These curves reveal facts until now not known.

### Rapid Increase in Volume

In Fig. 1, it will be noted that the volume remained practically constant in the early part of the blow, but in the latter part the volume increased rapidly from 18,000 to 30,000 cubic feet per minute, although pressure remained the same. The volume at the end increased about 60 per cent. It will be noted too that the slope of the volume curve decreases and flattens out just before the turn down. Fig. 2 shows corresponding pressure decreases.

This variation of metal bath resistance to the blast is caused by the changes in viscosity of the bath because of changes of composition and temperature and also by the increase of weight of the bath due to formation of silica and other oxides in the early part of the blow and to a decrease in bath weight due to elimination of carbon toward the end of the blow.

In Fig. 1 the point at which the increase of air volume takes place when operating at constant pressure is the place where "spitting" begins in the usual spitting blow. While the heat of Fig. 2 was blown and the blast volume was maintained constant, a second converter was charged with metal from the same mixer about 5 minutes after the first received its charge. The latter heat was given the same cold metal addition but was blown so as to maintain fairly constant pressure.

The blowing time of the two heats was exactly the same, but the heat blown while maintaining the volume constant did not spit at all, while the second blow with practically identical metal charge, same initial temperature, same weight of metal, and same cold metal addition as the first but with the large increase of blast volume at end of blow spit badly.

These special blows also demonstrate a fact which has an important effect on product uniformity and quality. A chemical change in the molten metal bath can be noted on the pressure gage practically the instant it occurs; such changes are indicated by the points *A* and *B* in Fig. 1. When they are noted, a change can be made in the rate at which oxygen, the chemical reagent, is added by increase or decrease of blast pressure or volume or both.

Old type installations with a number of blowers discharging into a common blast main serving two or more converters rendered impossible any regulation of pressure and volume to individual converters and thereby made it impossible to obtain the highest and most uniform quality of product.

To produce the best quality bessemer steel, it is necessary not only

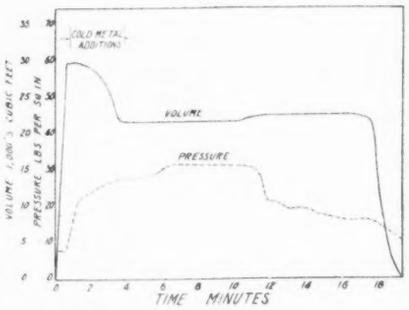



*Fig. 2—Blow maintaining constant volume*

to have a uniform quality of raw material, the iron, and to carry out the process by intelligent exercise of control, but to apply the same good judgment and intelligent direction in pouring, recarburizing, teeming, soaking pit and rolling practice.

For certain purposes, bessemer steel has characteristics which make it more desirable than any other material. These characteristics of soft bessemer steels are weldability, machinability and stiffness. The largest uses of the steel in this country are in the manufacture of skelp for welded tubes, sheet steel and tinplate, stock, wire, hoop and automotive forging stock.

Bessemer steel also is satisfying fabrication requirements where forming, shaping, drawing, welding and machining, in many cases with automatic machines, are among the most severe uses to which steel can be put. Greater stiffness of these steels is a decided advantage in certain enameling operations where warpage is decreased.

With the control of temperature and rate of oxidation which the bessemer converter affords to a greater

extent and to a higher degree than is possible by any other steelmaking process of today, bessemer steel in the future will be of finer quality than any tonnage steel made, according to Prof. McCaffery. Further, the process will be carried out in larger converters than at present; in fact, use of a 45-ton unit already has started in Germany.

The converter of the future will be operated on a predetermined cycle with adjusted composition and initial temperature. The volume and pressure of the air blast will be maintained or varied as the blowing cycle chart indicates, the regulation being automatic. The turn down will be done automatically either when the required air volume has been blown into the converter or by the carbon-flame drop, or one method may be used to check the other.

The blown metal on the turn down will then be at the proper temperature and it will contain the desired amount of silicon and manganese to obtain the proper softening reaction which will be completed during pouring.

For other than soft steel blows, the turn down will be made automatically when the predetermined volume of air has been blown to obtain the specified carbon. The bath will contain requisite silicon and manganese which, being residual, will rapidly deoxidize the metal so that on pouring no additions need be made for this purpose.

Prof. McCaffery said that every one of the elements or factors entering into what he called bessemer practice of the future is now employed in some plant, except the automatic control and turn down, and these two are the most easily executed of any of the proposals.

# Open-Hearth Costs Yield to Variety of Factors

INTENSIVE study in recent years of open-hearth operations has led to notable improvements in production rates, fuel consumption, furnace life, and in those costs for which the open-hearth operator normally is held responsible. Since he is furnished raw materials in quality and prices over which he has no control, generally in his opinion the ultimate cost of the net metallic mixture is fixed and his criterion of the performance of the open hearth is the cost above net metallic mixture.

However, if this standard alone is used to determine the efficiency of the open hearth, the losses involved in conversion are disregarded entirely and may result at times in increased ingot costs, in spite of decreased cost above net metal. This was the criticism made by Clarence D. King, chairman, open-hearth committee, United States Steel Corp., New York, in discussing the metallic charge in basic open-hearth operations and some factors affecting operating economies before the fall meeting of the American Iron and Steel institute meeting in New York.

### Clarifies Cost Idea

While the term "cost above net metal" is understood generally by the steel industry, Mr. King said that for purposes of clarity it should be defined as embracing all costs incidental to the conversion of any metallic mixture into steel ingots, but excluding the cost of ferroalloys and the monetary losses involved in the conversion of the charge into ingots. The latter losses would include metalloids eliminated; metallics lost in slag, in slag pockets, checker chambers, waste gases, etc.; and finally includes losses of material incidental to handling.

Monetary losses represent as much as 40 per cent of the cost above net metal and constitute an important factor in the total ingot cost. Such losses will be represented by the production of scrap, as well as irrecoverable losses, and appreciably affect the ingot yield. Since the cost above net metal ordinarily constitutes only from 15 to 30 per cent of the total ingot cost, it is obvious that any appreciable decrease in yield in turn affecting the cost of the gross and net metallic mixture may offset measurable savings in the cost above net metal.

### Reductions Are General

With the many improvements made in open-hearth practice during the past decade, the cost above net metal, as a rule, has been materially reduced; and this decrease has made the item of "loss and additions" of relatively greater importance. While in a large measure the cost above net metal does represent the progress made by an open-hearth plant, the true criterion of its performance may be indicated more accurately by the conversion cost, namely, the difference between total cost of ingots and the cost per ton of metallic charge, alloys excluded.

Mr. King detailed the iron-to-silicon ratio method which he developed two years ago for determining the ingot yield which might be obtained for different charges or different types of steel. The highest ingot yield does not necessarily produce the lowest cost of ingots and further, in addition to the cost of converting any metallic charge into ingots, the relation between pig iron and steel scrap prices, as well as the effects on other departments of the plant, largely governs the choice of type of charge to be employed for the usual grades of steel.

A greater portion of Mr. King's paper discussed the three well-known methods for converting metallic charges into basic open-hearth ingots, namely, hot metal plants, cold iron plants and duplex plants. Summations which the author made of the three methods are of interest.

Since all hot metal plants normally work with a balanced relation between the blast furnace production and open-hearth ingot production, occasional theoretical advantages which may be enjoyed by the use of cheaper steel scrap can only be consummated effectively under ideal conditions.

Obviously, the reduction in pig iron charge to consume more scrap, if accompanied by increased metal over the pig machine, will result in additional cost to the open hearth because of additional expenses in pigging the iron. Even where apparently ideal conditions exist, thorough studies must be made of the yields which may be obtained with various types of scrap employed, in addition to the many other factors affecting cost above net metal and production.

### Charge May Be Varied

It was shown that the cost above net metal may at times be increased through employment of different charges and yet result in a lower ingot cost due to cheaper net metallic mixture. Advantages obtained from such changes in practice are more likely to be obtained with reduced operations. For equal conditions, the conversion cost is a more inclusive and accurate picture of open-hearth efficiency, since not only is the cost above net metal included, but also the item of loss, and this item may be considered a reasonably accurate measure of the care manifested in open-hearth practice as shown by ingot yields obtained for equal conditions.

Any comparisons of factors affected by the metallic charge in the open-hearth furnace must be made on equal conditions; that is, the same types of steels produced, since the slag analysis will vary considerably according to the residual carbon in the bath, apart from differences in slag volumes. Unless these comparisons are made on equal conditions, serious misinterpretations can result

(*Continued on Page* 36)

# Excess Deoxidizers in Steel Cause of Porous Welds

TWO pertinent conclusions regarding the electric arc welding of steel were outlined by Wilmer E. Stine, research engineer, Lincoln Electric Co., Cleveland, speaking before the American Iron and Steel institute, Oct. 23, in New York. First: Presence in steel of aluminum oxides or any other nonmetallic inclusion which has its melting point between the melting point and boiling point of steel will cause slag holes, or pits, in the weld metal unless it is fluxed with some other material which lowers the freezing point below that of steel; and second: Aluminum, silicon, manganese, or any other deoxidizers having gas solvent properites, which are present in excess of the quantity necessary for chemical equilibrium with the oxygen present in the steel at a temperature slightly above the temperature of solidification, may cause the formation of gas holes in the weld metal.

### Performs Weld Tests

Porous welds, containing gas holes and slag holes, are recognized as defects to be avoided if possible in the welding operation. In an effort to classify the various factors which might effect the formation of porous welds, Mr. Stine tested several hundred specimens of different grades of steel, using an automatic shielded carbon arc welding machine.

It was found that steel which formed slag holes in the weld invariably had been aluminum killed and contained an appreciable amount of $Al_2O_3$. This characteristic was checked by covering a piece of good welding steel with a thin layer of $Al_2O_3$ before welding it. A porous weld was the result. Excess amounts of silicon and manganese produced porous welds also, although not to the same degree as aluminum.

Mr. Stine stated that slag holes in welds were caused by nonmetallic inclusions in steel which remained as finely divided solid inclusions during the steelmaking processes, where the temperature involved was around 1600 degrees Fahr.; but during the arc welding process, with a temperature of about 2500 degrees Fahr., these particles melted and coalesced to form large globules which solidified ahead of the steel and formed holes or pits in the weld metal. Elimination of these defects can be accomplished by using a slag-forming flux of low melting temperature which will combine with the slag of the steel, forming a new slag with a melting temperature below that of the steel.

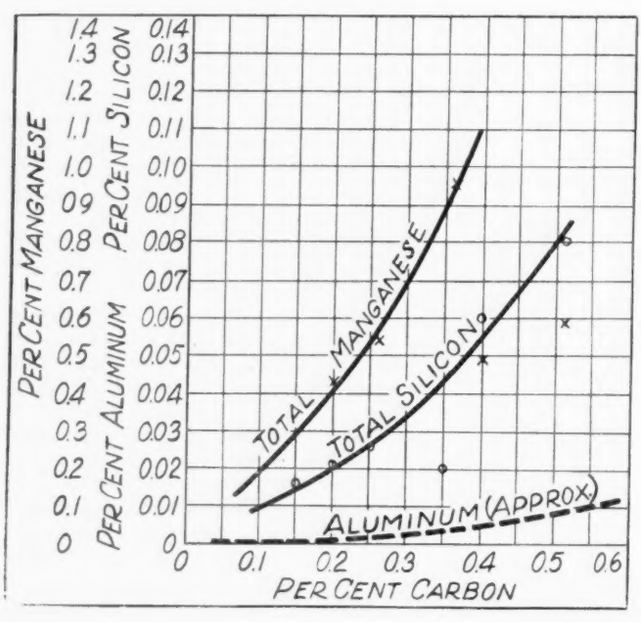
To determine what manganese, silicon and aluminum content in steel produces the best welding characteristics, the analyses of the steels that produced welds practically free from porosity were plotted against the carbon content, as shown in the curves which are reproduced on this page. A preliminary summation of this work was published on Page 49 of the May 21 issue of STEEL.

The curve for the aluminum is not plotted from actual analytical data taken during these tests. No satisfactory welds were obtained on any aluminum killed steel which showed by analysis more than 0.018 per cent total aluminum. Further it was discovered by another investigator that an addition of a given amount of aluminum to steel was as effective in preventing the formation of gas holes in steel castings as ten times that amount of silicon. In view of these determinations the curve for aluminum was drawn in as 10 per cent of the values of silicon.

### Tolerances Are Suggested

The values indicated in the curves for manganese and silicon are considered to be ideal values, and permissible tolerances have not been determined accurately. However, data seem to indicate that the following tolerances might be allowed: Manganese, plus or minus 0.10 per cent; silicon, plus or minus 0.015 per cent; and aluminum, plus or minus 0.01 per cent.

Other things being equal, the tendency for gas holes to form increases with the speed of welding, Mr. Stine declared. As arc welding speeds are being stepped up the importance of the proper quality of arc welding steel for plates, filler rods and electrode material becomes increasingly important.


PER CENT MANGANESE
PER CENT SILICON
PER CENT ALUMINUM
PER CENT CARBON
TOTAL MANGANESE
TOTAL SILICON
ALUMINUM (APPROX)
0 0.1 0.2 0.3 0.4 0.5 0.6
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4
0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14

*CURVES indicating aluminum, silicon and manganese content of steel of optimum arc welding characteristics as determined by several hundred welding tests*

## Open-Hearth Costs Yield to Variety of Factors

*(Continued from Page 35)*

in determining the value of any practice.

Cold iron plants must consider the type of charge and the cost of metallic mixture in relation to the cost above net metal to obtain the minimum cost ingots and open-hearth operators must recognize that at times, particularly where limited tonnages are desired, the increase in cost above net metal which may follow changes in metallic mixture may contribute to a lower ingot cost due to the reduction in cost of net metallic mixtures. It is essential that both items always be considered in determining the true economies of an open-hearth unit.

Since the rate of operations largely determines the type of charge to be employed in duplex plants, the theoretical consideration of the final ingot cost is secondary and may be considered as a result of the type of operation rather than the choice. Where limited tonnages are desired, it permits of certain flexibility with respect to choice of charge to be used, always bearing in mind the necessity of balancing the production of blast furnaces to open hearth requirements.

General conclusions set forth by Mr. King are as follows:

In any investigation of the effect

of metallic charge as affecting operating economies, it is necessary to determine to what extent ingot yields can be increased for equal conditions. Assuming that the slag volumes and analysis of slags are as required for the type of steels produced, increased yields can be accomplished only by limiting the pit scrap, steel skull, iron scrap and iron skull production to a point consistent with the economical operations of the plant. Such an improvement may lead to material savings, the magnitude varying with efficiency of the practice.

Excessive scrap production has a material influence on the final ingot cost and at times may warrant measures which may increase the cost above net metal, but result in a lower cost of net metal mixture and, therefore, result in reducing the total ingot cost. Further savings are possible at those plants which are in a position to convert some part of the losses into scrap credit, namely, the use of open-hearth slag at blast furnaces and utilization of checker chamber dust in flue dust sintering operations.

**Flexible Within Limits**

Discussions dealing with changes in proportions of the components of the metallic charge show that within limits the open-hearth furnace is sufficiently flexible to consume varying amounts of pig iron and steel scrap and that under certain conditions these changes may be made advantageously. Success of such changes will depend upon the differentials existing between pig iron and scrap, the effect on production capacity, cost above net metal, and particularly on other operating departments.

In investigations of this character it is necessary to determine ingot yields accurately when using different types of scrap, since a large difference in yield may offset apparently attractive savings through existing differentials between pig iron and scrap.

**Other Savings Possible**

Occasionally there are times when an increased cost above net metal, obtained by changes in charge, may be offset by a decreased net metallic mixture cost, resulting in a reduction in ingot cost. Even such savings cannot be considered the final criterion of the desirability of changes in charges, but they furnish some measure of the open-hearth economies which then can be translated into permissible increased operating costs for other departments, in order to obtain a net saving at the plant in question.

Because of the many variables, no conclusions can be drawn which will hold true of all plants, but it is obvious that the influence of the metallic charge on open-hearth operating economies is of such importance that comprehensive studies made along these lines will result in a more intimate and exact knowledge and ultimately produce material savings.

# Wider Knowledge of Basic Principles Aids Development of Magnetic Alloys

WITH increasing understanding of the causes of ferromagnetism and the factors that control ferromagnetic properties of metals, has come the ability to produce magnetic materials to suit requirements much more readily than possible in the past. Furthermore, as pointed out by T. D. Yensen, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., discussing "Magnetic Materials in 1931" before the American Iron and Steel institute in New York, Oct. 23, investigators have found discrepancies between the theoretical curves for ferromagnetic materials and the early experimental curves. These discrepancies have been traced to impurities in the ferromagnetic bodies and other factors that distort the crystal lattice; and as a result new methods of analysis and new metallurgical processes have been developed to control these factors.

Pure iron, or practically pure iron, can be produced in the laboratory in Ar em-type furnaces or in vacuum induction furnaces. This iron is recognized as having exceptional magnetic qualities. Commercial use of the material is hindered by high fabrication costs, since the iron would have to be used in the form of extremely thin gage sheets to prevent excess eddy currents. Furthermore susceptibility to oxygen and other impurities would result in serious impairment of a pure iron sheet by aging. Thus, iron alloys now are used universally where good magnetic properties are sought.

**New Alloys Effective**

Chief of the iron alloy group used for magnetic properties are various combinations of iron and silicon, and iron and nickel. A most recent development along this line is hipernik, an iron alloy with 51 per cent nickel, and possessing high permeability and low hysteresis loss. A special heat treatment of an iron alloy with 78½ per cent nickel produces remarkable magnetic properties, the material being known commercially as permalloy. Low cost and high initial permeability are its advantages.

Some iron-cobalt alloys are in use, one in particular being perminvar, 30 per cent iron, 45 per cent nickel and 25 per cent cobalt, useful where constant inductance or constant reactance is essential.

## Element No. 87 Discovered By Cornell Scientist

Dr. Jacob Papish, professor of spectroscopy, Cornell university, Ithaca, N. Y., has announced the discovery of element No. 87, thereby leaving only element No. 85 unidentified. The new element is found in a lustrous, velvet-black mineral called samarskite, which is worth about $2 a pound. Two million pounds of the mineral would contain 1 pound of the element, according to the calculations.

Element No. 87 is an insoluble solid and cannot be isolated because of its high inflammability. It is unusually sensitive to light and because of this it may have interesting possibilities for use in connection with photoelectric tubes and the like.

Its presence in the samarskite sample was one part of the element to two million parts of the material, indicating that it will never be abundant. Samarskite is a mineral rich in rare alkalies found in Norway, Siberia and the southern states of the United States.

## Acetylene Association To Convene in Chicago

A comprehensive program has been worked out for the thirty-second annual convention of the International Acetylene association to be held at the Congress hotel, Chicago, Nov. 11-13. Economic aspects as well as technical phases of oxyacetylene welding will be discussed.

Among the topics on the program are: Business prospects in 1932; welding and its future; revised A. S. M. E. boiler code; training welders; testing welds; aircraft, railroad, marine and automobile welding; welded piping design; pipe line welding; welding the new alloys; painting, enameling and lacquering welded joints; engineering education in welding; and industrial acceptance of welding.

A. Cressy Morrison, 30 East Forty-second street, New York, is secretary of the association.

*Using a special type of steel reinforcing, the engineers were able to keep the weight of the flooring on this bridge, when filled with concrete, down to 86 pounds per square foot including the wearing surface. The bridge is being built over the Youghiogheny river near McKeesport, Pa.*

# Grating Type of Steel Bridge Floor Combines Strength, Light Weight

TO MOST of us a bridge floor is simply something that has been laid upon the structural steel frame upon which we may ride or walk, somewhat of an afterthought after the bridge itself is designed and erected.

To the bridge designer, however, this floor is a rather serious problem in his design. The type and weight of floor which he proposes to use is one of the first questions which must be settled. He must know how much load this bridge is to carry, this load consisting of trucks, cars, and the like, which he calls live load, and the weight of the floor and the bridge itself which makes up the dead load.

### Lightness with Strength

The amount of live load is fairly well fixed by rules and ordinances and, therefore, cannot be varied. The floor must be studied carefully to provide sufficient strength, wearing qualities and nonskid surface, and at the same time be as light as possible. Weight is an all important factor, as the greater the weight of floor the greater the weight of the bridge to carry the floor.

Modern bridge floors of reinforced concrete with asphalt or concrete wearing surfaces run from 115 pounds per square foot upward and the weight of the floor alone may at times be at least twice the total live load to be carried. Much thought and study has been given to possible means of providing a floor which will meet all structural requirements and still be as light as possible.

One of the outstanding examples of what has been developed along this line is represented by the T-Tri-Lok flooring of the Boston bridge over the Youghiogheny river near McKeesport, Pa. This flooring primarily consists of tees punched or slotted, into which bars are forced under high pressure, forming an interlaced construction which, when filled with concrete, provides strength, and a hard nonskid surface. This type of flooring was developed originally by the Tri-Lok Co., Pittsburgh, following methods used by it for years in the manufacture of grating. The flooring for the bridge was fabricated by the Carnegie Steel Co., Pittsburgh.

The steel in the flooring of this bridge weighs 23½ pounds per square foot, and when filled with concrete the flooring will weight about 56 pounds per foot. This compares with 85 pounds for a reinforced concrete slab of equivalent strength, without wearing surface, and 115 pounds with wearing surface added.

For the Boston bridge, the steel flooring units were manufactured and shipped in pieces 30 feet 5 inches long, and 4 feet wide, assembled complete and provided with holes for plug welding to the bridge stringers. Concrete will be poured over this network of steel and vibrated to insure dense compact material.

An inspection trip to the new bridge was made Oct. 1 by I. Lamont Hughes, president, and C. L. Wood vice president, Carnegie Steel Co., and A. J. Diebold, Thomas M. Gregory and Harry Nagin of the Tri-Lok Co.

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## New Uses for Bolts Lead to Improved Manufacture

(*Concluded from Page* 33)

tion may be used in certain conditions where resistance to corrosive action is important. A certain steel of this type is capable of heat treatment by oil hardening from 1750 degrees Fahr., and drawing back to the desired hardness. In either the annealed or heat treated condition it is resistant to atmospheric and water corrosion and mild chemical attack.

In the field where heat resistance is important, a high-chromium steel of specific composition may be used, which will withstand temperatures up to 1800 degrees Fahr. This steel is austenitic in character and will not harden appreciably by heat treatment, but is hardened by cold working. It resists ordinary corrosive agents and nitric acid, and also has high resistance to scale, at temperatures up to 2100 degrees Fahr.

### Chrome-Tungsten Steel

For reaction chamber bolts where strength is required up to 1000 to 1100 degrees Fahr., and other purposes where high temperature strength and high "non-creep" values are required, the Bethlehem company has developed a chrome-tungsten steel, properties of which are indicated in table II.

This need of various steels for various purposes again calls for modern equipment in the manufacture and testing of the metal. Some bolts are made from heat treated bars. Electric furnaces for heat treating bars at the Lehigh mills of the Bethlehem Steel Co., were described on Page 43 of the Nov. 27, 1930, issue of STEEL.

Testing of the bar steel is as rigid as the tests applied to the finished bolts. The subject of creep is being given particular attention. Laboratory tests are made for periods up to 1000 hours, covering varied temperatures and varied stresses, all of which can be selected to correspond to the type of use for which the final product is intended.

A final important step in bolt and nut manufacture is the classification of inventories to provide prompt service for the buyer. At Lebanon there is a group of automatic nut tapping machines, shown in an illustration on Page 31, with a capacity of 1,500,000 per day. The warehouse regularly stocks 12,000 to 18,000 tons of bolts and nuts, in 36,000 distinct sizes and types.

# Gear Manufacturers Consider Problems of Industry

TO OBTAIN smooth-running, quiet, and long-wearing gears, tip relief in some form or amount generally is necessary. As the flank of the pinion tooth approaches the tip of the mating gear tooth, tip relief on the gear will delay the engagement until the sharp corner on the gear tooth has passed the theoretical initial point of contact. With this provision, gouging or scraping, with resultant vibration, noise and wear, can be avoided, should the two involute curves not be exactly tangent to each other at that point, T. R. Rideout, Nuttall Works, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., told members of the American Gear Manufacturers' association at their semiannual meeting, Oct. 15-17 in Pittsburgh.

This subject of tip relief was comprehensively treated by two speakers. Mr. Rideout considered the practical aspect and R. E. Peterson, manager of the mechanics division, research laboratories of the same company, viewed tip relief from a theoretical angle. These contributions and another on "Good Practice in the Manufacture of Speed Reducers," by P. C. Day, Falk Corp., Milwaukee, comprised the technical side of the meeting, leaving a good share of the program for discussion of commercial problems.

### Noteworthy Points Are Revealed

While some variance of opinion was evident as to the importance of tip relief in the design of gears numerous points brought out in the two papers were particularly worthy of note. Theoretically, Mr. Rideout declared, tip relief would not be necessary on accurate gears constructed of an inelastic material. In fact, the use of tip relief often is referred to as an error introduced to compensate for other errors in the gears themselves. Even if the involute curves were exactly tangent to each other at the point where contact would nominally first occur, there is a tendency for the sharp corner on the gear tooth to break the film of lubricant momentarily. Tip relief, he said, would remedy that condition to the extent of allowing an oil film to be present on each side of the contact point.

Quoting an old axiom: "Gears wear out until they wear in and then never wear out," Mr. Rideout contended that if not taken too literally the saying is true, for although gears will wear out eventually, the rate of wear is much less after the inevitable feed marks and surface imperfections of a pair of new gears have been worn away. It sounds paradoxical, but the judicious use of tip relief has proved itself to be of value in reducing the actual amount of wear. Without relief, he said, the initial rapid wear will form a ridge in the flank of the pinion tooth and round off the tip of the mating gear tooth.

The amount of tip relief should never be any greater than that necessary to obtain smooth action and to prevent interference. Continuity of action will be lost if the arc of action is not greater than the circular pitch. Most authorities agree that for smooth action the number of teeth nominally in contact, or the ratio of the arc of action to the circular pitch, must not be less than 1.4. This value gives a basis for the determination of the maximum amount of relief that can be used for any gear ratio.

### Higher Value Necessary

Of course, as the gear ratio decreases, the number of teeth nominally in contact becomes greater and a proportionately higher value should be used as the minimum. It is generally agreed that the higher the number of teeth nominally in contact, the smoother and more quiet a gear drive will be. Therefore, Mr. Rideout stressed the point that the amount of relief should never be greater than actually necessary to compensate for existing errors.

Under certain conditions, however, it was brought out, tip relief has serious disadvantages. In two mating gears, for instance, it sometimes happens that the combination of machining errors, distortions, and tip relief on the gear will give what is known as "delayed engagement." The plus in the tooth spacing of the pinion (the gear tooth spacing should be minus) is of such magnitude that contact of a pair of teeth is impossible until the first pair is passing out of engagement. As the pair of teeth carrying the load pass out of engagement, there is a deceleration of the gear through a distance equal to the error, and the second pair of teeth come into delayed engagement with an impact. A succession of these impacts will cause extreme wear and noise.

Mr. Peterson explained the theory of gear tooth tip relief from the standpoint of deformation and errors. It was disclosed that premature and delayed engagement may be prevented if the tip relief is designed according to certain simple equations derived.

Evolution of speed reducers produced by the Falk Corp., and some of the principal considerations which have governed their development were discussed by Mr. Day. Design and construction of a line of speed reducers must be absolutely sound and correct from an engineering standpoint because, Mr. Day said, when once done it cannot be undone or changed for a considerable period of time. Before a catalog can be published the designs must be completed and production costs and ratings analyzed with greatest care. This involves the designs and estimates for special tools, jigs and fixtures for economical production.

### Association's Progress Reviewed

One of the highlights of the meeting was the address by Honorary President, F. W. Sinram, president, Gears & Forgings Inc. Cleveland, on "How the A. G. M. A. Has Benefitted the Gear Manufacturer." He reviewed the progress of the organization and the work it has done, and called attention to the fact that the association has evolved 32 standards, recommended practices, etc. Some of these, he said, are American standards; more will be. Every executive should make it a point to see that his force is adequately supplied with all A. G. M. A. data and making proper use of it, Mr. Sinram declared.

Important as uniform cost accounting is to the industry, Mr. Sinram personally believes that lack of it is responsible in a small degree only for the present unsatisfactory situation as to prices. Although we do not have complete uniformity of cost practice, he stated, discussions at our meetings evidence the fact that most of our member companies do have some knowledge of costs. Why then, Mr. Sinram asked, the prevalence of so many prices which costs cannot justify? Apparently the old law of supply and demand is working overtime. If we are to believe what we hear and see, never before have the wiles of the purchaser, unscrupulous and the reverse, been more effective. However, he continued, the fault is not with him but with ourselves. An order seems to be the only objective; anticipating miracles, costs are ignored. The situation calls for courage and confidence, said Mr. Sinram.

Activities of the various technical committees were not extensive over the summer months due primarily to the added burden which most members have had to carry through the reduction of working forces. This was brought out in the report of the general standardization committee of which A. A. Ross, General Elec-

tric Co., West Lynn, Mass., is chairman. No recommended practices were submitted at the meeting. Progress reports, however, gave promise of definite action on the part of the various committees between now and the sixteenth annual meeting which will be held next May in Cleveland. Incidentally, the paper on tip relief by Mr. Rideout was offered by him as chairman to the tooth form committee as a progress report on tip relief, which is one of the subjects on the standardization program.

An object to be accomplished during the coming months is the formation of a standard requisition blank. For the past several meetings this matter has come to the front, emanating from a need for a standard blank which would show what a purchaser should specify when asking for a bid or ordering any particular type of gear.

In line with the trend toward increased attention in the direction of the commercial side of industry, the gear manufacturers again devoted considerable time to problems in this division of business. Two papers on "Mark-Up on Raw Material," by James C. Hope, Covert Gear & Mfg. Co., Lockport, N. Y., and H. O. James, D. O. James Mfg. Co., Chicago, were part of the commercial standards day program arranged for Oct. 16.

**Machine Hour Rate Unmolested**

Mr. James contended that by using a specific precentage as a mark-up on raw materials for estimating purposes, which in reality is no more than a resale profit, no interference is made with the computation of the machine-hour rate that is set aside by taking into consideration direct manufacturing and selling expenditures.

In any factory where raw materials must be processed in several departments, Mr. Hope set forth, there is no arbitrary percentage that may be safely applied to raw material cost to arrive at a mark-up covering costs, expenses and profits. There are not only wide variations in sizes and weights of materials which do not correspond to respective price variations, but also materials vary greatly in the amount of necessary processing.

In the opinion of Mr. Hope, material mark-up is best arrived at through a standard cost system. His definition simply is the difference between cost of raw materials and the selling price of the finished product, which difference is built up on the stepping stones of direct labor, factory burden, administrative, selling and general expenses, and profit.

Management is faced with the problems of various classes of business, as brought out in a paper on "How Management Can Readily Be Informed from Our Cost Records as To the Profit or Loss Sustained on Miscellaneous Special Nonschedule Jobbing Orders," by John P. Wright, Foote Bros. Gear & Machine Co., Chicago.

J. H. Jackson, Pittsburgh Gear & Machine Co., Pittsburgh, discussing "The Fallacy of Costing on an Average Basis," made an interesting observation as follows:

"In the face of favorable influences, it is a fact that the aggregate profits of the gear industry have been small, even in good years such as 1929, and have vanished completely in lean years. Partly, this has been caused by intentional, destructive, competitive tactics, but largely by unintentional errors in methods of compiling costs and pricing orders, resulting in the loss of profits, even on noncompetitive work where a fair profit was assured, assuming correct knowledge of costs.

"It is up to gear manufacturers as individuals and as a group to take advantage of our strategic position and help eliminate from their vocabularly that greatest fallacy of all, 'Profitless Prosperity.' There can be no prosperity without profits."

## Industrial Engineers Urged Toward New Planning

Focusing attention on factors which will assist industry in lifting itself out of the slough of the depression, members of the Society of Industrial Engineers meeting at their eighteenth national convention in Pittsburgh, Oct. 14-16, were advised that industrial operations must be guided by a new basis of planning if recurrent depressions are to be avoided.

Tribute was paid to the late Frank Bunker Gilbreth, industrial engineer, and the first Gilberth medal to be awarded each year for scientific management was presented to Dr. Lillian Gilbreth, who has carried on her husband's work. The medal bears profiles of Mr. and Mrs. Gilbreth on one side. Appearing on the reverse is "1931. Awarded to Dr. Lillian M. Gilbreth for her contribution to management."

Harold V. Coes, Ford, Bacon & Davis Inc., New York, in discussing depreciation, a policy matter, declared that obsolescence is giving executives more concern than deterioration since it is not adequately provided for in most cases. The more progressive companies charge the deterioration factor of depreciation either through machine-hour rates or factory overhead, directly to the cost of sales, and endeavor to secure in the price levels proper allowance for depreciation for every salable unit of product turned out and sold. This is not always true, however, of the factor of obsolescense since this frequently, like a fire to all intent and purposes, occurs without warning.

In outlining some essential rules for depreciation management, Mr. Coes suggested a review of plant and production facilities, particularly noting those items that changes in the art indicate may become obsolete within a given period.

John M. Carmody, editor, *Factory and Industrial Management*, was re-elected president of the society. Other officers re-elected were George C. Dent, Chicago, executive secretary, and E. A. Rummler, Chicago, treasurer.

## Gray Iron Group Supports Stabilization Plan

Unanimous support of the principles enunciated by the Chamber of Commerce of the United States, Gerard Swope and Owen D. Young, was voiced in a resolution adopted and referred to its directors by the Gray Iron institute holding its annual meeting at West Baden, Ind., Oct. 15-16.

In effect, the institute believes that certain changes in viewpoint and governmental attitude toward business are necessary both in correcting present industrial conditions and looking to future advancement. The institute affirms the principle that action can and should be obtained through industry and that the proper agency for developing group action is the trade association.

The resolution holds that each industry should provide its own machinery to bring stabilization by measures not dictated by the government, but supported by the proper governmental agencies. Modification of the Sherman act is sought with supervision by a national economic board empowered to assist in attaining trade association objectives without jeopardizing public interest.

Further, the assistance of such a planning board is asked in collecting full statistical data which will show the true relation between existing manufacturing capacity and normal demand.

Officers and directors elected to serve the institute for the coming year were reported on Page 21 of the Oct. 19 STEEL. Don McDaniel, Decatur Casting Co., Decatur, Ind., chosen first vice president as announced, declined the election, thereby advancing J. L. Carter, Sacks-Barlow Foundries Inc., Newark, N. J., to this position. J. H. Bruce, Bowler Foundry Co., Cleveland, was named second vice president.

A. E. Hageboeck, Frank Foundries Corp., Moline, Ill., was elected president and R. D. Phelps, Francis & Nygren Foundry Co., Chicago, treasurer.

# Study of Steelmaking Will Continue for 3 Years

CONSIDERABLE progress in the study and solution of steelmaking problems was revealed in the fifth annual progress report of the Metallurgical Advisory board to the Carnegie Institute of Technology and the United States bureau of mines, presented at Pittsburgh, Oct. 16. Attendance of 362 open-hearth operators and metallurgists of the steel and allied industries was a record, attesting to the importance of the work being carried on by the board, particularly in improving practice in the production of clean steel. The first open meeting in 1927 attracted 68.

The past year marked the completion of a five-year program on the study of the physical chemistry of steelmaking—an investigation which has resulted in definite and successful recommendations for the elimination of nonmetallic inclusions in the open-hearth bath—but the board announced that it plans to continue the work for another period of three years.

### Broad Program Under Way

Other investigations described at the meeting included a progress report on chromium-nickel-iron alloys; a progress report on the alloys of iron, manganese and carbon; a discussion of the solubility of carbon in iron-manganese-silicon alloys; a description of the electrolytic method for the determination of inclusions in steel; a discussion of viscosity relations in the system lime-silica-fluorspar; and a report on investigations on strong deoxidizers. A brief review also was presented of a study, begun this summer, on the effects of inclusions in steel.

The program on investigations of the physical chemistry of steelmaking have been carried on during the past five years under the direction of Dr. C. H. Herty Jr., physical chemist, United States bureau of mines, results of which have been reviewed at various times during that period. Findings that have been announced briefly are as follows:

The determination of solubility of iron oxide in pure iron and the correlation of the iron oxide content of open-hearth steel with this solubility curve, including the dedevelopment of the aluminum method for determining in a relatively short time the iron oxide in steel, and the determination of the relation between carbon and iron oxide contents in liquid steel and slag of various composition.

Completion of the entire program on formation and identification of nonmetallic inclusions whose base is iron oxide, and work on deoxidation with manganese-silicon alloys.

The development of the electrolytic method for determining nonmetallic inclusions in steel.

The determination of melting points and viscosities in various slag systems, these forming a solid foundation for future work on deoxidation and slag manipulation in the open-hearth furnace.

The application of the above to open-hearth work in the production of steel of greater cleanliness than has been obtained by present-day steelmaking practice. Practical tests on acid and basic open-hearth heats already show on the average a distinct improvement in quality and rejections where these principles have been put into practice at three plants.

Dr. Herty reviewed the work done on deoxidation of open-hearth steel with manganese-silicon alloys, including a determination of the most suitable proportion of manganese to silicon that will produce fusible inclusions easily coalesced and quickly separated into the slag. It was found that a special spiegel or silicomanganese alloy containing from 4 to 5 parts of manganese to 1 part of silicon appeared to be the most effective and indicated that it was practicable to make cleaner steel, perhaps at lower cost, through use of less ferromanganese, by the use of a deoxidizer of this type instead of using ferromanganese and ferrosilicon separately.

### Will Study Inclusion Effect

In describing actual results obtained on heats at mills in the Pittsburgh district, Dr. Herty pointed out that operations must be governed slightly to accommodate special conditions of various plants. Future study of this subject will concentrate on the practical application of the principles to the improvement of the open-hearth and bessemer processes and on a study of the influence of nonmetallic constituents on the physical properties, weldability, corrosion and defects of steel.

Investigations of chromium-nickel-iron alloys were described by Dr. V. N. Krivobok, metallurgist, bureau of metallurgical research, Carnegie Institute of Techhnology. The speaker pointed out that there are two limitations to the use of the rustless steels, intergranular attack by corroding gases at high temperatures and grain-boundary decomposition or disintegration which occurs when the sample has been heated for some time at 1000 to 1500 degrees Fahr.

The alloys were studied by means of magnetic analysis, microscopic observations and corrosion tests. Alloys of extremely low-carbon content, in which no carbide precipitation could take place were found to be immune from decomposition. When the carbon was increased above a certain small amount the decomposition process was practically independent of the carbon content, indicating there is little reason to aim at the low carbon content.

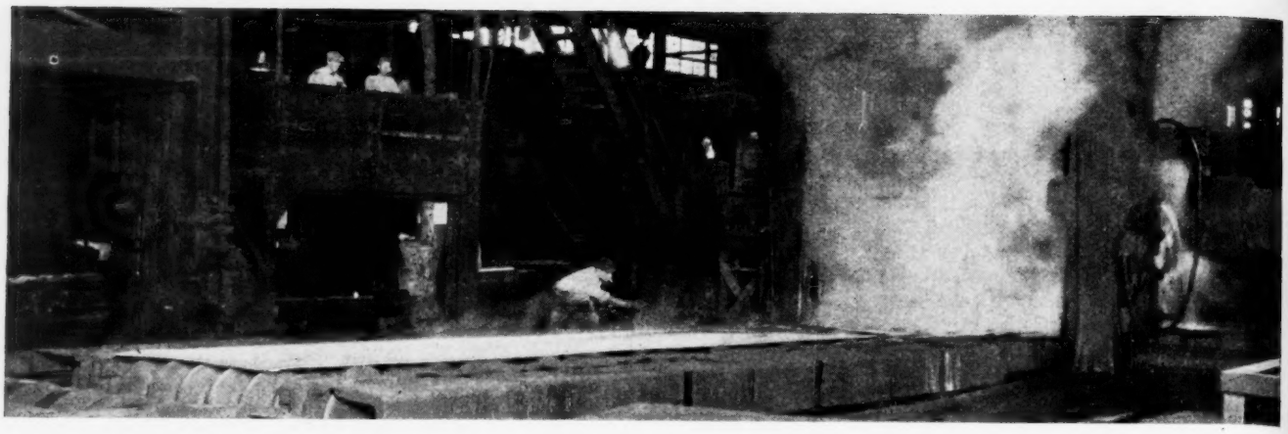
A large number of chromium-nickel-iron alloys with the addition of other elements, such as cobalt, molybdenum, silicon or copper, were observed when subjected to decomposition treatment. It was found that the additions of certain elements prevented phase change, but did not suppress precipitation of a constituent, presumably carbides, and that such precipitation had but little effect on some of the mechanical properties and resistance to corrosion in standard acid solutions. Changing the relative amounts of chromium and nickel in the alloy did not improve the alloy from the point of view of decomposition.

### Speller Is Re-elected Chairman

The progress report on the alloys of iron, manganaese and carbon was presented by Cyril Wells and Maxwell Gensamer, assistant metallurgists, bureau of metallurgical research, Carnegie Institute of Technology. This included results of a dilatometric study of the binary iron-manganese alloys as well as a thermomagnetic analysis of these materials. A separate study was made of alloys of iron containing 13 per cent manganese and 0.03 to 1.57 per cent carbon.

At the regular meeting of members of the advisory board F. N. Speller, director, department of metallurgy and research, National Tube Co., Pittsburgh, was renamed as chairman.

Dr. Thomas S. Baker, president, Carnegie Institute of Technology, presided at the annual dinner in Hotel Schenley in the evening, at which Charles F. Abbott, executive director, American Institute of Steel Construction Inc., New York, was the principal speaker. Taking for his subject, "Market Analysis in the Machine Age," Mr. Abbott touched upon the improved sales brought about in other industries through research, emphasizing at the same time that extensive markets similarly await development by steel producers and that research in selling is of primary importance.



# PROGRESS IN STEELMAKING

AT A SHEET mill in the Pittsburgh district sheets to be galvanized are passed through a pot having the intake, bottom and exit rolls motor driven. Pressure of the exit rolls is regulated by air cylinders, thus governing the thickness, uniformity and tightness of the zinc coating. The pot handles 150 tons of stock in 24 hours.

SNOWBALL heats. What a term to be found in the vocabulary of an open-hearth man! Yet at one steelworks where Southern iron is used for making low-carbon steels, the heat goes "flat" when the carbon is around 0.25 per cent. The practice is to use cast-iron borings to bring up the silicon content and to replace part of the pig. While the borings have about the same carbon content as the Southern pig, they are higher in silicon and lower in cost. With sufficient carbon the heats seldom go flat but when they do, they are known in charging floor parlance as "snowballs" because of the appearance of the furnace.

♦ ♦ ♦

The procedure followed by a large user of rectangular ingot molds is to make the corner radius equal to about 13 per cent of the longest side.

♦ ♦ ♦

A recent analysis of blooming practice on a 40-inch mill showed that steel is in actual contact with the rolls slightly less than 32 per cent of the time required to roll an ingot. By the installation of a modern screwdown control this occupied period was increased to 35 per cent and afforded an increase in the monthly output of 9000 tons.

♦ ♦ ♦

A recent development in blast furnace practice is the use of a refractory-lined blowpipe for conducting the blast into the furnace, particularly at those stacks where hot blast temperatures in the vicinity of 1500 degrees Fahr. are carried. The refractory blocks, which have a low thermal conductivity, are in their correct position in the mold before the blowpipe is cast. At a plant making merchant iron the use of insulated blowpipes has decreased the heat radiation approximately 30,000 B.t.u. per minute per blowpipe. At another stack it has been found that in event of a kick-back the slag in the blowpipe remains molten and the blast in most cases blows it back into the tuyere zone, leaving only a thin glaze on the refractory lining. A recent test conducted on a steelworks stack using refractory-lined pipes revealed that the hot blast temperature at the face of the tuyere was 28 degrees higher than when unlined cast-iron blowpipes were used on the same furnace. The lining prevents warpage and cracking and affords the furnace crew a greater factor of safety.

AN air-actuated steel plate dump box serving a hydraulic baling press is employed by a tin plate producer in the Pittsburgh district for speeding up the bundling operation. After the hot mill side and end scrap is raked in the container by men with hooks, one end of the box is raised to an inclined position and the scrap slides into the press compartment by gravity. While the scrap is being pressed into a bale the air dump box is being loaded and when the bundle of scrap is ejected and the low-pressure ram has returned to its starting position a new charge is available without delay.

BY INSULATING an 850-kilowatt pit-type electric furnace for annealing seamless tubes in 50-ton batches, an Ohio producer has reduced fuel consumption from 10 to 40 per cent.

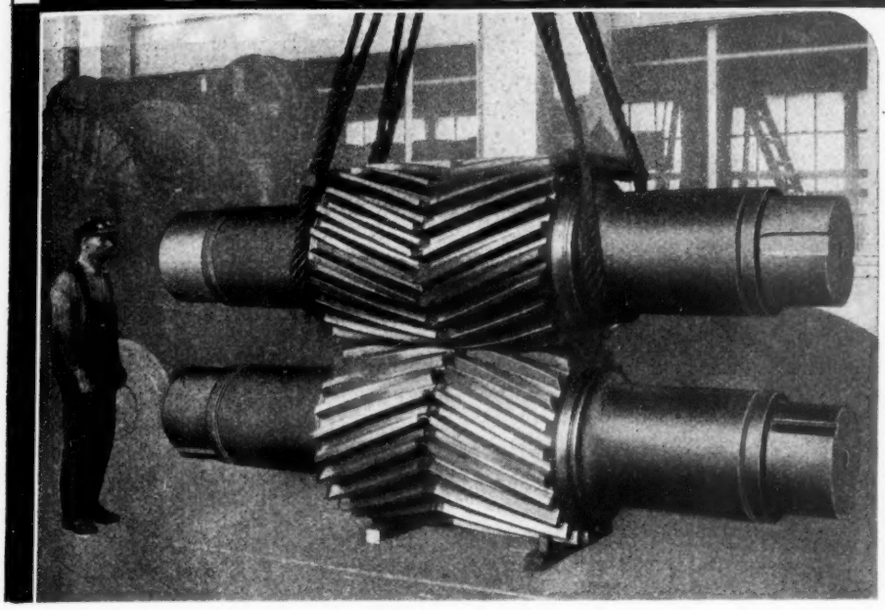
♦ ♦ ♦

As a means of gaging quality, quantity and economy, one large sheetmaker has each department submit its operating performance in B.t.u.'s for each ton of output, on each of the three 8-hour turns. This procedure affords the management the opportunity of comparing crews and metallurgical units and to obtain the highest efficiency output of equipment.

♦ ♦ ♦

In addition to a conservation of fuel, scientific application of heat to soaking pits also is saving many tons of steel formerly lost in the form of scale. Tests recently conducted at one plant on an ingot soaked in a noncontrolled pit and given four passes in the blooming mill showed a scale loss of 2½ per cent. Another ingot soaked in a pit under scientific control and subjected to four passes in the blooming mill showed a loss of only 0.77 per cent.

# MILL PINIONS . . . .



To withstand the extremely heavy and intermittent tooth loads encountered, accurately cut teeth are essential for long life in Rolling Mill Pinions. The result is smooth and quiet running, producing a finer finished product.

Mesta Cut Tooth Mill Pinions have accurate teeth with bearing across the entire face and are free from excessive backlash with both extremely large and fine pitch.

DOUBLE HELICAL
SINGLE HELICAL
STRAIGHT SPUR
CARBON STEEL OR ALLOY STEEL
FORGED OR CAST STEEL
PLANED TOOTH OR HOBBED TOOTH
ANY SIZE

**MESTA MACHINE COMPANY - - - Pittsburgh, Pa.**

# Mesta

*Photos, Courtesy Thompson Products Inc.*

*Exhaust valve from an airplane engine after 647-hour endurance flight; and machine department of valve manufacturing plant*

# Large Uses of Steel In Small Ways

203rd Article — Internal Combustion Engine Valves

VALVES for internal combustion engines, manufactured in the United States, require approximately 19,000 tons of steel in an average year. This estimate by a leading producer includes 18,800 tons for the valves in automobiles, trucks, motorcycles and power boats; and the remainder for those in aircraft and miscellaneous engines.

Though Webster defines a valve as a *device* for controlling the flow of gas, liquid or loose material, the word has come to mean generally the single T-shape part for closing and opening the port of the valve device. It is this part to which the tonnage estimate pertains.

Valves for automobiles and trucks range from 3 inches length, in the "bantam" cars, to 15 inches. Those in the most popular low-price cars are 6 inches. Airplane engine valves range in length from 6 to 10 inches, while those for air compressors are only 2 or 3 inches. Diameters of the heads are 1½ to 3 inches.

In addition to the valves which go into the original installation in automobiles there is a considerable replacement demand, and for every car, a valve manufacturer sees an average of 12 valves. For every airplane, he knows that approximately 18 have been or are being manufactured.

A wide variety of plain and alloy steels is used. The first valves to be made were turned out of a solid bar of steel, a plan which due to excessive waste and labor, was soon modified. In later types the head was welded to the stem, or threaded and welded. Combinations of cast iron and steel were tried, such as a cast-iron head and a steel stem, or a cast-iron ring forced around the circumference of the head.

### Various Methods Tried

In 1916 it became the practice to forge a valve from a single piece of plain steel. With the increasing number of alloy steels, possessing superior physical qualities and marked resistance to heat and corrosion, new fields were opened for the choice of valve steel. As a result of war research, in 1920 the first silicon-chromium steel was introduced and was found to be excellent valve steel, although rather difficult to work satisfactorily. Grinding and machining problems, however, soon were overcome.

This silicon-chromium valve was adapted to use in airplane engines and was so successful that the government test limit, originally 50 hours, was raised to 300 hours, following experiments which showed the valve in good condition after 387 hours of service.

Automotive intake valves are made from a special steel, S.A.E. 3140, and a few from S.A.E. 6150. A chrome-nickel-silicon steel is being used for most aircraft exhaust valves. A high-tungsten steel, S.A.E. 71360, generally is used for aircraft intake valves and some exhaust valves, in addition to a cobalt-chromium steel, PRK-33, an English steel.

### Head Is Upset

The general manufacturing sequence is as follows: Round bar stock is hot sheared to proper length. The lengths are preheated, the valve head is upset on headers, and the stem forged to approximate size. Annealing and pickling treatments follow, with subsequent machining and grinding. Careful machining and grinding are necessary to provide utmost accuracy in stem and head.

Some airplane engine valves have salt-filled stems. This feature is provided by drilling the stems, packing with some salt, such as lithium nitrate, then closing the end of the stem on headers. Other aircraft valves have dish-shaped heads to provide increased radiating surface. A new type of exhaust valve has a copper core through the stem and extending partly into the head. This is made by a special undivulged forging process.

## Lead Coating Process Can Be Employed in Field

A process for applying a permanently-adhering lead coating of any desired thickness to metal surfaces as a protection against corrosion has been announced by the Gross Engineering Corp., 3730 West Seventy-third street, Cleveland. This process, known as "leadhesion," is the result of a new development in present lead fusion methods.

The company, which specializes in the coating of tanks, vacuum and pressure vessels, and moving parts of acid or brine-proofed machinery, states that the lead is as easily and effectively applied in the field as in the shop. Much of this equipment must be coated in position. One application for the process is that of protecting blades of agitators, fans and centrifugal blowers which are exposed to corrosion.

The process was invented by Louis Gross, president of the company, and is said to embody refinements of technique over his original lead coating processes which have been used in Europe, North and South America for many years. Mr. Gross is an authority on lead burning and lead fusion and has had wide experience in the design, construction and lead coating of corrosion-proof equipment for agitators, digesters, etc., for the oil refining, paper making and chemical industries.

# . . . a few go nautical

Every now and then we don our sea-legs and ship a few tons of steel castings in a coastal direction. The other day we pleased a customer with a sprinkling of deck-ware for a couple of small Diesel tugs. We've even cast propeller wheels for the busy electric ferries . . . cast massive tumblers for gold dredges in distant Siberian wastes . . . cutter heads that dive to watery depths and churn obstacles from river channels . . . went high hat, over a week end, by pouring a rudder frame for a millionaire's yacht.

That's but one slant of our general foundry trade. We've many more—reflective of stabilized practice and good alloy steels to fill inherent demands. Or, should your requirements run *vra firma*—we'll go *landlubber* to please you.

**BIRDSBORO**
STEEL FOUNDRY AND MACHINE COMPANY
DESIGNERS AND BUILDERS
BIRDSBORO, PENNSYLVANIA

## Sheet Distributors Seek Former Discount

(*Concluded from Page 20*)

discount again was heard, as this controversial subject was discussed by distributors. Several representatives of the mills also participated in the discussion. F. O. Schoedinger, Columbus, O., president of the association, empowered the sheet steel committee to pursue its efforts to get the sheet mills to reinstate the discount after a warm discussion in which F. R. Meyer Jr., vice president, Inland Steel Co., Chicago, presented a well defined statement, upon request of the distributors themselves, of the economic necessities that brought about, as far as his company was concerned, the elimination of the 2 per cent discount for a cash discount of 0.5 per cent.

Mr. Meyer pointed out that all raw materials going into sheet steel production, including ore, coal, limestone and zinc, must be bought on a cash basis, that freight rates much be paid without a 30-day net discount, and that prices had been forced below the level of profits. He pointed out that none of the other steel products was sold on a 2 per cent discount basis, and companies felt they no longer could give away a discount they did not receive.

**Others Voice Opinions**

Other sheet mill representatives who spoke were F. M. Fuller, American Sheet & Tin Plate Co., Pittsburgh; Frank A. Moeschl, Newport Rolling Mill Co., Newport, Ky., and L. D. Mercer, Republic Steel Corp., Youngstown, O. The latter pointed out that with business conditions constantly changing, new practices are inevitable, and that distributors should have within their power the regulation of what discount should be passed on to their own customers.

Distributors contended that they are obliged to pass on to their customers the 2 per cent discount. Chairman Schoedinger characterized the refusal of sheet producers to restore the discount as "a most serious drawback to the industry." Frank S. Rost, Frankfurth Hardware Co., Milwaukee, contended that with a large number of distributors it is virtually impossible to adopt unanimously a lower discount, and that a limited number of producers may enforce a small discount with less difficulty.

C. S. Harper, Harper & McIntire Co., Ottumwa, Iowa, favored a readjustment upward of sheet steel prices, rather than not restore the 2 per cent discount. A. W. Howe, J. M. & L. A. Osborn Co., Cleveland, emphasized the inability of distributors to pass along a reduced discount. "Advance the price, if you will," he said, "but restore the 2 per cent discount in justice to the sheet jobber."

The sheet steel committee's report indicated the association would be satisfied with the present discount rate on uncoated sheets, such as black and blue annealed, and urged a closer discrimination as to the beneficiaries of the 10-cent differential on carload shipments of sheets.

The long-term view indicates ample opportunity in the building construction industry for broadening the application of sheet metal products, it was stated by J. H. Christman, vice president and general sales manager, Milcor Steel Co., Milwaukee, in an address on conditions prevalent in the sheet metal building products industry. He declared that a broad field lies in the adaptation of metal in large and small building.

**Quality at Peak**

Mr. Meyer emphasized the improved quality of the sheets now turned out by the mills. He pointed out that sheet products are being broadened, rolling is closer to tolerances, coatings have improved, and that it behooves distributors to watch their stocks. He declared, however, that it is impossible for mills to give more in prices, and that the market has reached the irreducible limit.

Discussion of conditions in tin and terne plate distribution was led by Walter H. Donlevy, Carter, Donlevy & Co., Philadelphia. He stated that the terne plate market, particularly in the eastern part of the country, continued in a distressed mood. He cited severe competition of other products, unprofitable orders and, in many instances, too liberal credits as disadvantageous to the distributor.

## Extends Use of Special Malleable Iron

A specially processed malleable iron known as Promal, developed by the Link-Belt Co., 910 Michigan avenue, Chicago, and for four years used exclusively by the company its own chain products, now is available to any manufacturer, according to announcement of the company. Facilities of the company's Ewart Works, Indianapolis, where the iron is made, have been increased to take care of general industrial demand.

By special processing the malleable iron is said to be transformed into a material of radically different microstructure and physical properties. Described briefly in STEEL, July 30, 1930, page 91, the material's characteristics are great strength and resistance to wear, high ductility and low production cost.

Physical properties are set forth by the manufacturer as follows: Yield point, 50,000 pounds per square inch; ultimate strength, 70,000 pounds; fatigue strength, 33,000 pounds; elongation in 2 inches, 10-14 per cent; modulus of elasticity, 26,000,000; coefficient of thermal expansion, 0.0000109 inches; electrical conductivity, 0.211 ohms per mil foot; permeability, 79 at 200 ampere-turns; specific gravity, 7.35; and average brinell hardness, 170-190.

It can be heated repeatedly to 1000 degrees Fahr. and cooled without affecting physical properties; for corrosion resistance it can be made copper bearing; and by suitable alloy additions can be given higher physical strengths.

## Develops New Series of Low-Alloy Steels

A series of low-alloy steels containing chromium, manganese and silicon, designated "cromansil" steels, has been developed by the Electro Metallurgical Co., New York. Properties and applications of these steels are described in a 12-page bulletin just issued by the company.

Most useful forms of the steel contain 0.4-0.6 per cent chromium, 1.1-1.4 per cent manganese, and 0.7-0.8 per cent silicon, with carbon ranging from less than 0.10-0.65 per cent, depending upon the application. These three elements in combination are said to result in high ultimate strength, great ductility, high fatigue limit, high impact strength and ready machinability. Another important effect is increase in the latitude of allowable finishing temperature of rolling.

Manufactured by the open-hearth process, the steel can be used as rolled or in the heat treated condition. By selection of appropriate alloy percentages it is generally possible to obtain desired physical properties without heat treatment, or with a simple normalizing, with or without subsequent tempering.

It can be rolled and fabricated with facility and welding is performed as for carbon steel of the same shape. Among applications for which the steel is claimed to be especially advantageous are ship plates and naval structural parts, bridges and buildings where a high strength-weight ratio is valuable, chimneys, penstocks, pressure vessels, tanks, boilers, staybolts and high-strength seamless tubing, such as oil well casings.

## Conference on Welding

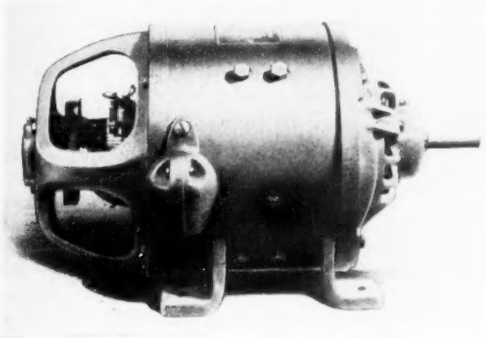
Engineering extension department of Purdue university announces its seventh annual conference on welding, to be held at Lafayette, Ind., Dec. 10-11. The meeting will comprise lectures, demonstrations and exhibits. Requests for additional information should be addressed to the engineering extension department of the university, W. A. Knapp, professor in charge.

# Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

## Refillable-Type Commutator Is Feature of Motor

Reliance Electric & Engineering Co., 1088 Ivanhoe road, Cleveland, has developed a new line of direct-current motors to supplement its larger type-T heavy duty units. The new motors are built in sizes ranging from ½ to 3 horsepower, 1750 revolutions per minute, for constant or adjustable speed operation.



*WINDINGS of new direct-current motor built by Reliance Electric & Engineering Co. are coated with orange-colored enamel to facilitate easier detection and removal of dirt. Two brushes per stud provide better commutation*

Either ball or sleeve bearings are provided and open, semiclosed or fully-enclosed construction is available. Windings of these units are given a finishing coat of bright orange-colored enamel to enhance the ease of detecting and removing dirt. This is claimed to decrease maintenance and prolongs the life of the motor. A feature usually not found in such small units is the refillable-type commutator. If the copper bars should become damaged or badly worn, they may be removed and replaced easily.

◆

## Improved Benchboards Use Standard Control Units

General Electric Co., Schenectady, N. Y., announces an improved design of control benchboard suited particularly for use in connection with steel mill drives, transfer bridges, conveyor systems and remote control of haulage systems.

These new bench boards make it possible to take full advantage of modern mountings which enable standard controllers, push buttons, indicating lamps, etc. to be used. This insures minimum maintenance expense and cuts out loss of time in obtaining spare parts.

With the new design, individual devices are supported directly from the top of the board or of the frame. This eliminates internal brackets as well as special shaft, dial plate and stop extensions. At the same time it provides more room within the frame for wiring, simplifies inspection, and results in more rigid construction. Rigidity also is increased by liberal use of welding.

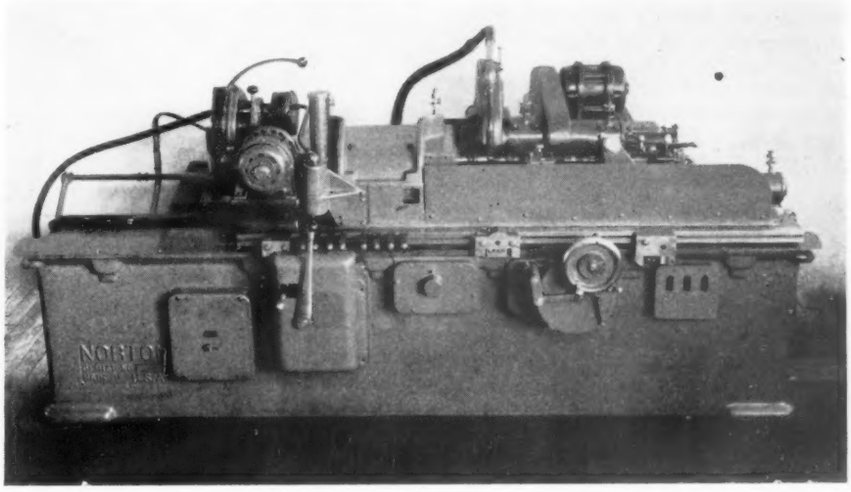
All types of these new benchboards have removable backs which facilitate assembly of units and provide easy access to the interior in case changes are necessary. When designed to be placed with back to the wall, openings are provided at both ends. Flat or sloped tops can be furnished, although the sloped top generally is recommended as neater in appearance and more accessible.

◆

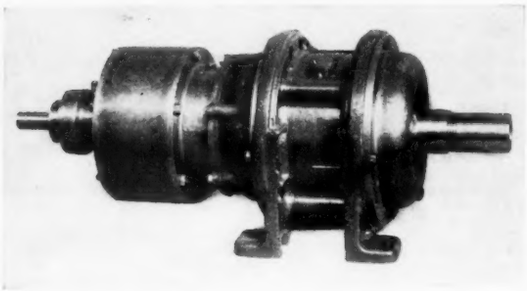
## New Cam Grinding Machine Has Pushbutton Conirol

Norton Co., Worcester, Mass., has placed on the market an automatic cam grinding machine in which most of the various functions are performed hydraulically. Automatic features make it possible for one operator to attend three or four machines.

After the camshaft has been placed in the machine, the grinding operation is started by pressing an electric pushbutton conveniently located near the operator's position as shown in the illustration below. This actuates solenoids one of which actuates the valve controlling the table movement, and the other the work drive clutch. As the table moves so that the first cam to be ground is opposite the grinding wheel, another clutch is engaged automatically, which starts the grind-



*Front view of Norton automatic cam grinding machine from slight elevation to show camshaft in position for grinding. Note pushbutton control*



*VARIABLE speed transmission designed by Weiss Engineering Corp. is characterized by unique construction which permits infinite variations of output shaft speeds*

ing cycle. Three cycle speeds are available.

Three motors are required to drive the machine, one a 3 or 5 horsepower constant-speed unit mounted on the wheel slide and driving the grinding wheel. A 1-horsepower motor is mounted on the table and drives the work, while a third which is rated at 5 horsepower, is stationed at the rear of the base of the machine and is direct-connected to the lubricant pump, and also drives the backshaft from which the hydraulic pump and cycle mechanism obtain their power.

Bases for all lengths of machines are single castings arranged to rest on three points. The table also is a single casting on which are mounted the rocking bar, the diamond tool holder and the bracket which supports the master cam roller and work drive mechanism. Indexing of the table is accomplished hydraulically from one position to the next by means of a cylinder and piston. Trip dogs carried in a T-slot at the front of the machine correctly position the table for grinding each cam.

Hydraulic feed is provided for moving the wheel rapidly to the grinding position and slowly during the actual grinding, the change from one speed to another being entirely automatic. For truing, an adjustable mechanical feed is employed which is independent of the hydraulic feed.

The machine is made in three lengths to take camshafts 36, 42 and 48 inches between centers. The 36-inch machine weighs approximately 12,000 pounds.

◆

## Speed Transmission Gives Infinite Variations

Weiss Engineering Corp., Grand Central Terminal building, New York, has developed a variable-speed transmission in which an infinite number of output shaft speeds ranging from 0 to 0.234 times the input shaft speed is available. The unit, shown on this page in connection with a motor, consists of a rotating, or more strictly, a nutating element which is carried on ball bearings over the surface of the inside of the casing. This element is connected to the output shaft by a rolling ball universal joint that operates with a constant angular velocity up to a maximum angle of 40 degrees.

Torque applied at the driven shaft tends to force the ball bearings radially against the spherical surface of the casing. A connection between the input shaft and the nutating element is made by a splined shaft connected through a double link to a sleeve on a short shaft extension from the nutating element. The splined shaft may be moved endwise by a control lever, and thus will cause the nutating element to make an angle with the vertical.

### Angle Determines Power

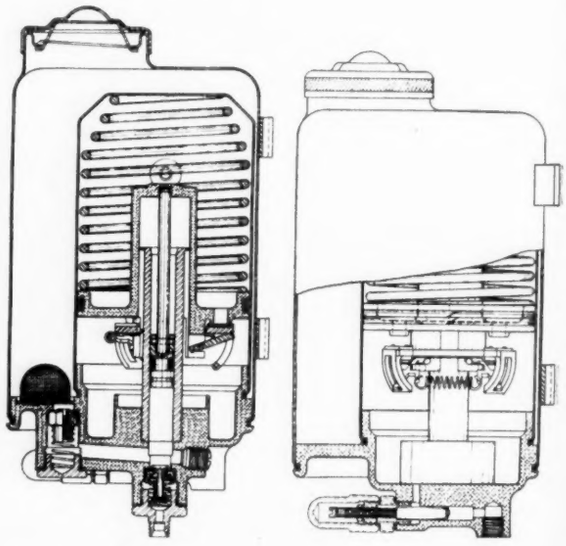
When the element is vertical, the axis of the input shaft and that of the element are in alignment and the output element remains stationary when the input shaft is rotated as the sleeve simply revolves on its shaft. When the element is shifted away from the vertical, it begins to nutate and rotate, and transmits power to the output shaft, the amount of this power depending directly upon the amount of angle of the element with the vertical position.

◆

## New Lubricating System Is Operated Automatically

Lubrication Devices Inc., Battle Creek, Mich., recently introduced a new type of automatic lubrication system controlled by the operation of the machine on which it is installed. Predetermined amounts of oil are delivered to every bearing immediately upon starting the machine and the supply is cut off as soon as the machine is shut down. Rate of delivery of the lubricant to the bearings is not dependent upon the speed of the machine, but is controlled by a simple adjustment provided on the compressor unit. The system of lubrication consists essentially of three parts—the compressor unit, a single main pipe line and a measuring valve at each bearing of the machine to be lubricated.

The operation of the automatic compressor unit, shown in the accompanying illustration, is entirely hydraulic, and a pressure of 20 pounds per square inch or more is the only motive power necessary for "shooting" the system. No cams, levers, toggles, ratchets or gears are required. The compressor unit is self-contained within a one-quart reservoir. It is of simple construction with all parts sealed. A measuring valve, operating on the positive piston displacement principle, delivers to the bearing the correct amount of lubricant. Pressure built up in the supply line acts on the valve piston, forcing the measured charge of lubricant into the bearing at high pressure.



*TWO views of compressor unit of lubrication system developed by Lubrication Devices Inc. A measuring valve operating on the positive piston displacement principle delivers to the bearing the correct amount of lubricant*

# Market Tone Is More Encouraging

## Trend of Demand Upward, Though Operating Rate Still Wavers — Rail Purchases Heavier — Automotive and Structural Outlook Favorable

MORE indications of improvement in basic conditions in the steel market are appearing, in isolated spots, but sufficient in aggregate to brighten the outlook. This tendency, now noted for several weeks, however, has not yet been translated into better rolling schedules, steelmaking operations this week being fractionally lower than 28 per cent, the rate last week.

Most encouraging of current market features is expanding demand for rails. Santa Fe has closed for 43,000 tons with three mills; Atlantic Coast Line for 15,000 tons; and the Boston & Maine for 10,000 tons. Illinois Central may be in the market shortly for 20,000 to 30,000 tons, and eastern railroads are expected to purchase 35,000 to 45,000 tons additional in the next ten days.

Railroad shop orders show more volume at Chicago. For 750 cars, chiefly rebuilding, for the Chicago & Illinois Midland, 7000 tons of steel will be required.

Beginning late this month or early in November a larger flow of steel to the automotive industry is inevitable. Practically all the Detroit manufacturers are preparing for new models; Hudson-Essex has already begun production; Chevrolet has scheduled 80,000 units for November. Steelmakers are confident of substantial improvement in business from this source, at least during next month. Already many parts plants are humming. Several tractor plants at Chicago are resuming.

Moderate gain is noted in structural shape awards, 15,681 tons for the week, compared with 15,137 tons in the week preceding. Several large awards are in immediate prospect, such as 11,465 tons for New York's west side elevated highway; 12,000 tons for the Triboro bridge towers, New York; 12,000 tons for the United States Supreme Court building, Washington; 13,000 tons for the Cleveland postoffice. For Chicago's west side elevated highway, if authorized this year, 85,000 to 90,000 tons of steel will be required by spring.

Practically all changes noted in current steel demand are on the favorable side of business, and the bright spots are not confined to any one territory. For example, wire products are selling in heavier volume in New England; purchasing of bolts, nuts and rivets is more active at Pittsburgh and Chicago, and the Pacific coast is experiencing the best business in months in reinforcing bars, plates and iron pipe.

The International Utilities Corp. is formulating plans for a gas line from Montana and Wyoming, through Oregon and Washington, a $30,000,000 project, which will take considerable 20-inch pipe. Pennsylvania railroad is in the market for 6500 tons of steel pipe for use along the Schuylkill river, Philadelphia. Reconditioning of Great Lakes vessels promises to provide a large market for plates.

So far as steel is concerned it appears the railroads have won the major portion of their demands for higher rates. It is estimated the increases will mean a total addition of approximately 60 to 70 cents a ton on finished steel. On iron ore, coal, coke and scrap the advance will be $3 a car; on slag, pig iron, billets, $6 a car; and on finished steel, in some cases, 2 cents per 100 pounds, and in others up to $16 per car.

Producers thus are faced with higher costs some time in December. A substantial portion of their saving from recent steel wage reductions is likely to be dissipated.

Current price readjustments are restricted to pig iron. Reductions in practically all grades in the valleys drop STEEL's composite for iron and steel 8 cents to $30.68. The finished steel composite is unchanged at $48.22, and the steelworks scrap composite remains $8.50.

## Composite Market Averages

| | Oct. 24 | Oct. 17 | One Month Ago (Sept., 1931) | Three Months Ago (July, 1931) | One Year Ago (Oct., 1930) | Ten Years Ago (Oct., 1921) |
|---|---|---|---|---|---|---|
| Iron and Steel Composite | $30.68 | $30.76 | $31.03 | $31.05 | $32.26 | $35.46 |
| Finished Steel Composite | 48.22 | 48.22 | 48.72 | 48.68 | 50.13 | 54.75 |
| Steelworks Scrap Composite | 8.50 | 8.50 | 8.82 | 8.70 | 12.32 | 11.89 |

**Iron and Steel Composite:**—Pig iron, billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. **Finished Steel Composite:**—Plates, shapes, bars, sheets, hot strip, nails, tin plate, pipe. **Steelworks Scrap Composite:**—Melting steel, compressed sheets.

# Comparative Prices of Iron, Steel and Coke

**Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago**

| | Oct. 24, 1931 | Sept., 1931 | July, 1931 | Oct., 1930 |
|---|---|---|---|---|
| **PIG IRON** | | | | |
| Bessemer, del. Pittsburgh | $17.76 | 18.26 | 18.26 | 19.36 |
| Basic, valley | $ 15.00 | 17.00 | 17.00 | 17.00 |
| Basic, eastern del. eastern Pa. | 16.00 | 16.50 | 16.75 | 17.50 |
| No. 2 foundry, del. Pittsburgh | 17.76 | 18.26 | 18.26 | 18.46 |
| No. 2 foundry, Chicago | 17.00 | 17.50 | 17.50 | 17.50 |
| *Southern No. 2, Birmingham | 12.00 | 12.00 | 12.00 | 14.00 |
| **No. 2X, Virginia furnace | 18.00 | 18.00 | 18.25 | 18.25 |
| **No. 2X, Eastern del., Phila. | 17.26 | 17.26 | 17.51 | 19.26 |
| Malleable, valley | 16.50 | 17.00 | 17.00 | 17.80 |
| Malleable, Chicago | 17.00 | 17.50 | 17.50 | 17.50 |
| Lake Superior, charcoal, del. Chi. | 25.04 | 25.54 | 27.04 | 27.04 |
| Gray forge, del. Pittsburgh | 17.13 | 17.63 | 17.63 | 17.83 |
| Ferromanganese, del. Pittsburgh | 89.79 | 89.79 | 89.79 | 103.79 |

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $11, Birmingham. **2.25 to 2.75 silicon.

| | | | | |
|---|---|---|---|---|
| **COKE** | | | | |
| Connellsville furnace, ovens | 2.40 | 2.40 | 2.40 | 2.60 |
| Connellsville foundry, ovens | 3.25 | 3.25 | 3.25 | 3.50 |
| **SEMIFINISHED MATERIAL** | | | | |
| Sheet bars, open-hearth, Youngs. | 29.00 | 29.00 | 29.00 | 31.00 |
| Sheet bars, open-hearth, Pitts. | 29.00 | 29.00 | 29.00 | 31.00 |
| Billets, open-hearth, Pittsburgh | 29.00 | 29.00 | 29.00 | 31.00 |
| Wire rods, Pittsburgh | 35.00 | 35.00 | 35.00 | 36.00 |

| | Oct. 24, 1931 | Sept., 1931 | July, 1931 | Oct., 1930 |
|---|---|---|---|---|
| **FINISHED MATERIAL** | | | | |
| Steel bars, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Steel bars, Chicago | 1.70 | 1.70 | 1.70 | 1.70 |
| Steel bars, Philadelphia | 1.89 | 1.89 | 1.89 | 1.89 |
| Iron bars, Chicago | 1.70 | 1.70 | 1.70 | 1.75 |
| Shapes, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Shapes, Philadelphia | 1.76 | 1.76 | 1.76 | 1.76 |
| Shapes, Chicago | 1.70 | 1.70 | 1.70 | 1.70 |
| Tank plates, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Tank plates, Philadelphia | 1.80½ | 1.80½ | 1.80½ | 1.80½ |
| Tank plates, Chicago | 1.70 | 1.70 | 1.70 | 1.70 |
| Sheets, No. 10 blue anneal., Pitts. | 1.85 | 1.85 | 1.85 | 1.95 |
| †Sheets, No. 24, hot, ann., Pitts. | 2.40 | 2.40 | 2.40 | 2.40 |
| Sheets, No. 24, galvan., Pitts. | 2.90 | 2.90 | 2.90 | 3.00 |
| Sheets, No. 10 blue anneal., Chi. | 2.00 | 2.00 | 2.00 | 2.15 |
| †Sheets, No. 24, hot, ann., Chi. | 2.55 | 2.55 | 2.55 | 2.60 |
| Sheets, No. 24 galvan., Chi. | 3.05 | 3.05 | 3.00 | 3.20 |
| Plain wire, Pittsburgh | 2.20 | 2.20 | 2.20 | 2.30 |
| Wire nails, Pittsburgh | 1.90 | 1.90 | 1.85 | 2.00 |
| Tin plate, per base box, Pitts. | 4.75 | 5.00 | 5.00 | 5.00 |

†Comparisons are with old classification No. 24 black sheets.

| | | | | |
|---|---|---|---|---|
| **SCRAP** | | | | |
| Heavy melting steel, Pitts. | $10.25 | 10.80 | 10.50 | 14.80 |
| Heavy melting steel, eastern Pa. | 8.00 | 8.50 | 8.75 | 12.00 |
| Heavy melting steel, Chicago | 7.75 | 7.95 | 8.50 | 11.55 |
| No. 1 wrought, eastern Pa. | 9.50 | 9.75 | 9.75 | 14.25 |
| No. 1 wrought, Chicago | 8.00 | 8.00 | 8.25 | 10.95 |
| Rails for rolling, Chicago | 10.50 | 10.50 | 10.50 | 14.10 |

# Sheets

**Larger Orders from Automotive Industry Expected in November Sales Better September**

SHEET PRICES, PAGE 51

**Pittsburgh**—Sheet business continues slightly heavier than a month ago. Improvement in automotive orders is gradual and mills look for no large tonnages before November. The two leading motor car builders are proceeding slowly with work on new models and there are some reports that the new Ford car will not be in dealers' hands before the end of the year. Sheet orders from miscellaneous buyers show little change and mill operations still hold around 30 per cent. Orders are insufficient to provide a thorough test of prices although recent quotations are well observed on new business. The market is 2.40c, Pittsburgh, for hot-rolled annealed sheets, 2.90c for galvanized, 1.85c for blue annealed and 3.10c for autobody.

**New York**—Sheet business continues to mark time with the general volume light. Most orders are for immediate shipment. Prices are unchanged.

**St. Louis**—Purchasing by jobbing and warehouse interests is considerably less than the usual season volume. Sales of galvanized material in the farm districts is slow.

**Philadelphia**—Sheet sellers are confident the next 30 days will bring a larger volume of specifications from automotive interests. Current business is dull and prices are unchanged.

**Youngstown, O.**—Small orders are coming to local mills from automotive partsmakers. The Ford Motor Co. is buying on 30-day commitments, but it is understood the Chevrolet Motor Co. has covered for its probable fourth quarter requirements with the understanding that its receipts of steel in both November and December will be much greater than in October. Miscellaneous buyers of sheets continue to take fairly satisfactory shipments. Some galvanized material also is moving in small lots to makers of roofing products and large receptacles. Quotations are steady.

**Cleveland**—The average order for sheet steel remains small, but the week's business includes some good daily sales totals. The impending upturn in automotive production is noted here in orders from small part-stamping shops for sheets, though the credit situation is in some instances a deterrent. Dies in the Fisher Body Co. plant here now are generally installed for the first run of new Chevrolet bodies this week. The local barrel industry is dull. The price structure is firm.

**Cincinnati**—Little fluctuation is noted in sheet mill production, not quite at 40 per cent. New bookings from automotive sources have been improving for two weeks.

**Chicago**—Slightly more numerous sheet orders at the close of the week followed several days of the poorest business this year. The mild upturn was due to replenishment of depleted stocks by jobbers and several manufacturers. While prices are untested for larger orders, No. 24 galvanized, are quoted at 3.00c, Gary and Indiana Harbor. Sheet jobber business is estimated at 50 per cent under 1929.

**Birmingham, Ala.**—Sheet mills continue operating above 50 per cent. New orders are mainly for building purposes.

## Leads in Natural Gas Use

In 1929, and probably also today, the United States consumed 95 per cent of the entire natural gas supply of the world, states the National Industrial Conference board, New York. Expansion in consumption of natural gas is from 481 billion cubic feet in 1909 to 1918 billion cubic feet in 1929. A phenomenal expansion in long distance transportation of natural gas has taken place in the past three years, states the board.

# Current Finished Steel Prices

**Prices in cents per pound unless otherwise stated**

## Steel Sheets

**HOT ROLLED No. 10**

| | |
|---|---|
| Pittsburgh base | 1.70c |
| Gary, Ind. Harbor, base.. | 1.80c |
| Chicago, del. | 1.85c |
| Philadelphia, del. | 1.99c |
| Birmingham, base | 1.85c |

**BLUE ANNEALED No. 9-10**

| | |
|---|---|
| Pittsburgh, base | 1.85c |
| Chicago, district mills | 1.95c |
| Chicago, delivered | 2.00c |
| Philadelphia, del. | 2.14c |
| St. Louis, delivered | 2.20½c |
| Birmingham | 2.00c to 2.05c |
| San Francisco, c.i.f. | 2.33c |

**HOT ROLLED ANNEALED No. 24**

| | |
|---|---|
| Pittsburgh, base | 2.40c |
| Gary, Ind. Harbor, base | 2.50c |
| Chicago, del. | 2.55c |
| Philadelphia, del. | 2.69c |
| Birmingham, base | 2.55c |
| St. Louis, del. | 2.75½c |

**GALVANIZED No. 24**

| | |
|---|---|
| Pittsburgh, base | 2.90c |
| Gary, Ind. Harbor, base | 3.00c |
| Chicago, del. | 3.05c |
| Philadelphia, base | 3.19c |
| Birmingham, base | 3.05c |
| St. Louis, del. | 3.25½c |

**AUTOMOBILE No. 20**

| | |
|---|---|
| Pittsburgh, base | 3.10c |

**FURNITURE**

| | |
|---|---|
| Pitts., No. 10 heavy | 2.75c |
| Pitts., No. 20 light | 3.35c |

**TIN MILL BLACK No. 28**

| | |
|---|---|
| Pittsburgh, base | 2.65c |
| Gary base | 2.75c |
| St. Louis, del. | 3.00½c |

**HEAVY COLD ROLLED No. 10**

| | |
|---|---|
| Pittsburgh base | 2.35c |
| Gary, Ind. Harbor, base | 2.45c |
| Chicago, del. | 2.50c |
| Philadelphia, del. | 2.64c |
| St. Louis, del. | 2.70½c |

**COLD ROLLED No. 20**

| | |
|---|---|
| Pittsburgh, base | 2.95c |
| Gary, Ind. Harbor, base | 3.05c |
| Chicago, del. | 3.10c |
| Philadelphia, del. | 3.24c |
| St. Louis, del. | 3.30½c |

## Tin and Terne Plate

**Prices per 100 pound box Pittsburgh**

| | |
|---|---|
| Tin plate, coke base | $4.75 |
| Gary, Ind., base 10 cents higher. | |
| Long ternes, 24, unassorted, lb. | 3.15c |

## Wire Products

**(To Jobbers-Merchant Trade)**

F.o.b. mills, 100 lb. keg

| | |
|---|---|
| Standard wire nails | $1.90 and 2.00 |
| Cement coated nails | 1.90 and 2.00 |
| Galvanized nails | 3.90 and 4.00 |
| (Per pound) | |
| Polished staples | 2.35c and 2.45c |
| Galvanized staples | 2.60c and 2.70c |
| Barbed wire, gal. | 2.55c and 2.65c |
| Annealed fence wire | 2.35c and 2.45c |
| Galvanized wire | 2.80c and 2.90c |
| Woven wire fencing, (9-11 ga.) | $55.00 and $60.00 |
| (12½ ga. and lighter) | 60.00 and 65.00 |

**(To Manufacturing Trade)**

| | |
|---|---|
| Plain wire, 6-9 gage | 2.20c |
| Spring wire | 3.20c |

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

## Rivets

| | |
|---|---|
| Struc. c.l., Pitts.-Cleve. | 2.25c |
| Struc., c.l., Chicago | 2.35c |
| 7/16-in. smaller, Pitts. | 70, 10 and 5 off |
| Chi., Cleve. | 70, 10 and 5 off |

## Steel Plates

| | |
|---|---|
| Pittsburgh, base | 1.60c |
| Philadelphia, del. | 1.80½c |
| New York, delivered | 1.88c |
| Boston, delivered | 2.00c |
| Chicago, base | 1.70c |
| Cleveland, base, for railroads | 1.65c |
| Lackawanna, N. Y., base | 1.70c |
| Birmingham, base | 1.75c to 1.80c |
| Coatesville, Pa., base | 1.70c |
| Pacific Coast, c.i.f. | 1.85c to 1.95c |
| St. Louis, del. | 1.95½c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh, base | 1.60c |
| Philadelphia, del. | 1.76c |
| New York, del. | 1.85½c |
| Boston, del. | 1.98½c |
| Chicago, base | 1.70c |
| Cleveland, delivered | 1.78½c |
| Lackawanna, N. Y., base | 1.70c |
| Birmingham base | 1.75c to 1.80c |
| Pacific Coast, c.i.f. | 2.05c to 2.15c |

## Bars

**SOFT STEEL**

| | |
|---|---|
| Pittsburgh, base | 1.60c |
| Chicago, base | 1.70c |
| Birmingham base | 1.75c to 1.80c |
| Lackawanna, N. Y., base | 1.70c |
| Pacific Coast, c.i.f. | 2.05c |
| Cleveland, base, local del. | 1.65c |
| Cleveland base, out. del. | 1.65c |
| Philadelphia, del. | 1.89c |
| New York, del. | 1.93c |
| Boston, del. | 2.00c |
| Pittsburgh, cold finish | 1.85c |
| Pittsburgh, forg. qual. | 1.90c |

**RAIL STEEL**

| | |
|---|---|
| Chicago Heights | 1.50c to 1.60c |
| Eastern mills | 1.30c |
| Pittsburgh | 1.30c to 1.35c |

**IRON**

| | |
|---|---|
| Chicago, base | 1.70c |
| New York, delivered | 1.93c to 2.03c |
| Philadelphia, delivered | 1.89c to 1.99c |
| Pittsburgh, refined | 2.75c to 4.25c |

**REINFORCING**

| | |
|---|---|
| Pitts., billet cut lengths | 1.75c |
| Stock lengths, mill | 1.60c |
| Chi., billet | 1.40c to 1.60c |
| Chi., rail steel | 1.25c to 1.50c |
| Chi., rail steel, bridge and culvert | 1.35c to 1.60c |
| Philadelphia, cut lengths | 2.04c |
| Cleveland, cut lengths | 1.75c |

## Cold Finished Bars, Shafting

| | |
|---|---|
| Base, Pittsburgh, Chicago, Buffalo and Cleveland | 2.10c |
| Shafting, turned and ground, Pittsburgh, Cumberland, Md. | 2.45c to 2.90c |

## Corrosion, Heat Resist. Alloys

**Base, Pittsburgh**

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

| | A | B | C | D |
|---|---|---|---|---|
| Bars | 19c | 20.5c | 23c | 28c |
| Plates | 21c | 22.5c | 25c | 30c |
| Sheets | 26c | 27.5c | 30c | 35c |
| Hot strip | 19c | 20.5c | 23c | 28c |
| Cold strip | 25c | 26.5c | 32c | 37c |

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

## Wrought Washers

| | |
|---|---|
| Carloads, Pitts. dist. | $6.50 to $6.75 off |
| Carloads, Chicago dist. | 7.00 to 7.45 off |

## Alloy Steel

**Hot Rolled—F.o.b. Mills**

**Alloy Quality Bars, 2.65c, mill**

| S.A.E. | Alloy Diff. | S.A.E. | Alloy Diff. |
|---|---|---|---|
| 2000 | 0.25 | 1.25-1.75 Ni. | 1.05 |
| 2100 | 0.55 | 5100 .80 - 1.10 | |
| 2300 | 1.50 | Cr. | 0.45 |
| 2500 | 2.25 | 51.00 Cr. | |
| 3100 | 0.55 | spring | 0.20 |
| 3200 | 1.35 | 6100 bars | 1.20 |
| 3300 | 3.80 | 6100 Spring | 0.95 |
| 3400 | 3.80 | Cr., Ni., Van. | 1.50 |
| 4100 .15 to .25 | | Carbon Van. | 0.95 |
| Mo. | 0.50 | 9250 (flats) | 0.25 |
| 4600 .20 to .30 Mo. | | 9250 (rds.,sq.) | 0.50 |

## Strip, Hoops Bands

| | |
|---|---|
| Hot strip, to 6-in., Pitts. | 1.65c |
| Do, 6 1/16 to 24-in., Pitts. | 1.55c |
| Hot strip, bands 6 in. and under, Chicago | 1.75c |
| Do, 6 1/16 to 24 in. | 1.65c |
| Cooperage hoop, Pitts. | 1.70c to 1.80c |
| Do, Chicago | 1.85c to 1.95c |
| Cold rolled strip, Pitts., Cleveland | 2.15c |
| Worcester, 3 tons, over | 2.30c |

## Rails, Track Material

| | |
|---|---|
| Standard bess. and open hearth rails, mill | $43.00 |
| Relay rails, Pitts., 20 to 45 lbs. | $22.00 to $26.00 |
| 50 to 75 | 20.00 to 24.00 |
| 80 to 100 | 24.00 to 27.00 |
| Light rails, 25-45, mills | $34.00 |
| Light rails, Chicago | $36.00 |
| Angle bars, Chi. base | 2.75c |
| Spikes, railroad, mills | 2.70c |
| Spikes, railroad, 7/16-in. and smaller, Pitts. | 2.70c |
| Spikes boat, barge, Pitts. | 2.90c |
| Spikes, railroad, Chi. | 2.80c |
| Track bolts, Pitts., steam roads | 3.80c |
| Do, standard, jobbers | 73 off list |
| Track bolts, Chicago | 3.80c |
| Tie plate, mills | $39.00 |

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

**CARRIAGE BOLTS**

All sizes, cut thread ..... 73 and 10 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 73 and 10 off

**MACHINE BOLTS**

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 and 10 off
Tire bolts ..... 60, 10 and 10 off
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

**NUTS**

Semifinished ..... 73 and 10 off

**HEXAGON CAP SCREWS**

Milled ..... 80-10-10-5 off
Upset 1 in. diam. and smaller ..... 85-10 off

**SQUARE HEAD SET SCREWS**

Milled ..... 80-5 off
Upset 1 in. and smaller ..... 80-10-5 off
Upset, larger than 1 in. ..... 80-5off

## Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh ..... 2.50c
Do, less carloads, 5 kegs or over, 2.75c; less than 5 kegs 2.90c.
Chain, BB, BBB, 9/16-1½ in. ..... 33 1/3 off
Sheet piling, Pitts. ..... 1.90c

# Structural Shapes

**Super Highway, Chicago, May Take 80,000 Tons Next Year—West Side Elevated, New York, to Take 11,465 Tons—Activity Marked in East as Pending Total Rises**

STRUCTURAL SHAPE PRICES, PAGE 53

**New York**—Bids go in next month on more than 11,000 tons of structurals for another section of the west side elevated highway. Towers for the Triboro bridge will take close to 12,000 tons, bids also expected in a few weeks. Several large projects, including postoffices, loom active soon after the first of the year. School work is again active with 1500 tons up. Prices hold at 1.70c, Bethlehem, Pa., on plain shapes, but keen competition and much shopping on the part of buyers results in erratic erected and fabricated prices. About 1200 tons for the United States embassy buildings will be bought in Europe.

**Boston**—Pending structurals for schools and other public work is slightly more active, though not brisk. Most projects are under 300 tons, although a state bridge over the Connecticut river on which bids are due Oct. 28 will take 2400 tons.

**Philadelphia**—Shapes are moving slowly with 1.70c, nearest mill, the usual carload price.

**Pittsburgh**—Structural inquiry is declining seasonally and pending work is smaller as a result of recent closing on several large lots. Plain material usually is 1.60c, Pittsburgh, except large lots which develop some concessions.

**Cleveland**—On such ordering as is current, 1.60c, Pittsburgh, is holding well. Almost virtual absence of private building places a heavy burden on a few federal and city jobs, which, once in contractors' hands, are slow to close. Plans are expected soon on the Cleveland postoffice to take 13,000 tons, half of which will be silicon steel.

**Chicago**—Few structural awards of over 1000 tons are placed. The status of the elevated super-highway for the west side of Chicago is uncertain. If authorized this year, the project would be of importance for next season's market, as 75,000 to 80,000 tons of structural steel would be required. Plain material prices are less subjected to pressure, the base remaining 1.70c, Chicago. Decision of the Illinois supreme court in holding the state prevailing wage law unconstitutional means that all of the public projects let since July 1, totaling 10,000 to 12,000 tons and involving $34,000,000, must be readvertised and deferred until next season.

## Contracts Placed

1920 tons, shops, Duncan field, San Antonio, Tex., to Ingalls Iron Works, Birmingham, Ala.; A. J. Rife Construction Co., Dallas, Tex., contractor.

1720 tons, four hangars and other buildings, Barksdale field, Shreveport, La., to Belmont Iron Works, Philadelphia; government contract, W. M. Werner, Shreveport, general contractor.

1500 tons, Third street bridge, San Francisco, to Pacific Coast Engineering Co., Oakland, Calif.

1008 tons, Franklin street bridge, Evansville, Ind., to American Bridge Co., Pittsburgh, through Globe Construction Co., Evansville; 68 tons reinforcing steel to be purchased.

700 tons, penitentiary, unstated location, to Van Dorn Iron Works, Cleveland.

700 tons, school, Union City, N. J., to Maxwell Sprio & Co., Jersey City, N. J.

626 tons, sheet steel piling, San Gabriel river outlet for Los Angeles county to Pacific Coast Steel Corp., San Francisco.

550 tons, municipal power house, Wyandotte, Mich., to Whitehead & Kales Co., Detroit; H. G. Christman-Burke Co., Detroit, contractor.

515 tons, addition to school, Hastings, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

450 tons, interurban bridge for Milwaukee Electric Railway & Light Co., Milwaukee, to Wisconsin Bridge & Iron Co., Milwaukee.

420 tons, gymnasium, Knoxville, Tenn., to Converse Bridge & Steel Co., Chattanooga, Tenn.

400 tons, public school 45, Staten Island, N. Y., to Harris Structural Steel Co., New York.

380 tons, postoffice, Brownsville, Tex., to Houston Structural Steel Co., Houston, Tex.; A. J. Rife Construction Co., Dallas, Tex., contractor.

365 tons, postoffice, Helena, Mont., to American Bridge Co., Pittsburgh.

360 tons, bridge, Irwins, Pa., for Erie railroad, to Pittsburgh - DesMoines Steel Co., Pittsburgh

300 tons, museum, Springfield, Mass., to Haarman Steel Co., Holyoke, Mass.

300 tons, shapes and bars, buildings, state hospital, Shelton, Conn., to Topper & Griggs, Hartford, Conn.; Charles Smith & Sons, Derby, Conn., contractor.

291 tons, overpass and bridge, Runnels county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.; D. F. Jones Construction Co., Little Rock, Ark., contractor.

250 tons, high school, Chester, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa., through Steel Service Inc.

245 tons, bridge, Rensselaer, N. Y., to American Bridge Co., Pittsburgh.

228 tons, spans at several points for St. Louis & San Francisco railroad, to Virginia Bridge & Iron Co., Roanoke, Va.

200 tons, bridge over barge canal, Comstock, N. Y., to Lackawanna Steel Construction Co., New York.

200 tons, *Pasadena-Post* building, Pasadena, Calif., to McClintic-Marshall Corp., Bethlehem, Pa.

200 tons, St. Sabinas church, Chicago, to Hansell-Elcock Co., Chicago.

200 tons, hangar for National Air Transport Co., Dallas, Tex., to Mosher Steel & Machinery Co., Dallas, Tex.

200 tons, highway bridge, California, to Minneapolis-Moline Power Implement Co., Minneapolis.

181 tons, state bridge, Hadley-Luzerne, N. Y., to Lackawanna Steel Construction Co., Buffalo; Burr M. Stark, Troy, N. Y., engineer and contractor; 29 tons bars to Truscon Steel Co., Youngstown, O.

150 tons, bridge, Boulder City, Nev., to International Derrick & Equipment Co., Los Angeles.

130 tons, service building, Meriden, Conn., to Berlin Construction Co., Berlin, Conn.

120 tons, bridge near Downey road, Los Angeles county, to Consolidated Steel Corp., Los Angeles.

120 tons, hosiery mills, Lansdale, Pa., to Bronson Iron & Steel Co., Philadelphia.

110 tons, postoffice, Wichita Falls, Tex., to Mosher Steel & Machinery Co., Dallas, Tex.; J. W. Underhill Construction Co., Dallas, contractor.

100 tons, miscellaneous steel plates and structurals, Guggenheim foundation building, University of Akron, Akron, O.; 37 tons shapes to Burger Iron Co., Akron; 12 tons reinforcing steel to McClintic-Marshall Corp., Bethlehem, Pa.; Indiana Engineering & Construction Co., Akron, contractor.

100 tons, bridge, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines, Ia.

100 tons, school, Middlebush, N. J., to Elizabeth Iron Works, Elizabeth, N. J

100 tons, state buildings, Massachusetts, to A. L. Smith Iron Works, Chelsea, Mass.

100 tons, two tanks and standpipes for Seattle, to Western Engineering Corp., Seattle.

100 tons, bridge, shapes, weights and machinery, near Hudson Falls, N. Y., to Hardie-Tynes Mfg. Co., Birmingham, Ala.

## Awards Compared

| | Tons |
|---|---|
| **Awards, week ended Oct. 24** | **15,681** |
| **Awards, week ended Oct. 17** | **15,137** |
| **Awards, week ended Oct. 10** | **24,540** |
| **Awards this week in 1930....** | **28,873** |
| **Av. weekly awards, 1930....** | **35,242** |
| **Av. weekly awards, 1931....** | **36,184** |
| **Av. weekly awards, Sept.....** | **62,558** |
| **Total awards to date, 1930..** | **1,580,831** |
| **Total awards to date, 1931..** | **1,592,100** |

## Contracts Pending

13,000 tons, postoffice, Cleveland; plans soon. Half tonnage to be silicon steel.

12,000 tons, three bascule bridges, Joliet,

Ill., and other Illinois bridgework; readvertised bids Nov. 2, 12 and 24.

12,000 tons, United States Supreme Court building, Washington; George A. Fuller Co., New York, low on general.

11,465 tons, including 465 tons silicon steel, 1500 tons, ornamental structural steel, 345 tons steel castings, 300 tons cast iron, 100 tons ornamental cast iron and 10 tons miscellaneous iron and steel, superstructure second section, West Side elevated highway, Twenty-second to Thirty-eighth street, New York; estimates complete with bids to be taken in about one month. Foundation contract for section let and under construction.

5000 to 6000 tons, Times building, Los Angeles; bids in December.

1500 tons, Schuylkill drive, Philadelphia, for Pennsylvania railroad; F. A. Canuso & Son, low on general.

1500 tons, federal reformatory, Springfield, Mo.; bids Dec. 12.

1000 tons, highway bridge for Nebraska highway commission.

1500 tons, municipal bridge, Michigan avenue, Buffalo; bids Nov. 5.

700 tons, office building, Peoples National Bank, Tyler, Tex.; Robert J. Cummins, Houston, Tex., consulting engineer; bids soon.

625 tons, sheet piling, substructures, Sag Harbor and Greenport bridges, Shelter Island sound, New York.

600 tons, pier sheds No. 144-5-6, Los Angeles; bids in December.

600 tons, storage bins, Six Companies Inc., Boulder City, Nev.; bids being taken.

600 tons, highway bridge, Wausau, Wis.

600 tons, armory, Peekskill, N. Y.; former bids rejected, readvertised.

550 tons, public school 85, Bronx; bids Oct. 29.

500 tons, addition, Ford Motor Co. assembly plant, Chester, Pa.

500 tons, public school 79, addition, Whitestone, Queens; readvertised, bids Oct. 29.

400 tons, Goldberg Arcade building, Oak Park, Ill.

350 tons, filtration plant, Ft. Wayne, Ind.

320 tons, high school, Dedham, Mass.

300 tons, building for United States government, Ottawa, Ont.

275 tons, state bridge, Kinney county, Texas.

200 tons, courthouse, Cambridge, Mass.

200 tons, school, Exeter, N. H.

175 tons, school, Providence, R. I.

170 tons, state bridge, Maryland, over Town creek; bids Oct. 27.

115 tons, National Milling Co. building, Toledo, O.; MacDonald Engineering Co., Chicago, architect.

100 tons, state bridge, route 10, section 3, Whippany, N. J.; William Isenberg & Sons, Camden, N. J., contractors.

Unstated tonnage, Pennsylvania railroad requirement; bids Nov. 5.

Unstated tonnage, exchange building for Illinois Bell Telephone Co., Monroe and Loomis streets, Chicago; Holabird & Root, Chicago, architects.

Unstated tonnage, customs appraisers' store building, Canal and Harrison streets, Chicago; plans being prepared by supervising architect, treasury department, Washington, D. C.

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Hillside Fluor Spar Mines, 38 South Dearborn street, Chicago, has increased its stock from 2000 to 4000 shares no par value.

# Concrete Bars

**Over 5000 Tons Bought at Washington This Week—Awards Heavier Than Inquiry at New York—Illinois Court Decision Holds Up Work—Awards Are Large**

REINFORCING BAR PRICES, PAGE 53

**Chicago**—All of the Illinois road contracts awarded since July 1, last, must be readvertised as a result of the Illinois supreme court decision holding the state prevailing wage law unconstitutional. This involves 3000 to 4000 tons of reinforcing bars that must await next season before shipment is ordered. Both billet and rail steel bars lack stability in price. If the elevated super-highway for the west side of Chicago is projected this year, about 10,000 tons of reinforcing bars would be placed on next season's schedules.

**Boston**—State highway bridges on which general contract awards are about to be closed account for approximately 300 tons of concrete bars. Prices are easy, rail steel going into some work with 2.00c shaded.

**New York**—Pending reinforcing bar work is gradually being closed, awards leading new inquiry. Three jobs were closed at Washington, taking close to 5000 tons. New Jersey state work and New York bridges are included in new pending tonnage. Prices on small lots are fairly firm.

**Philadelphia** — Reinforcing bar prices have stiffened further, cut lengths holding generally at 2.04c, Philadelphia. On less carloads $3 a ton premium is beign quoted. Rail steel is unchanged at 1.30c, eastern mills.

**Buffalo**—Two large mill projects which had been figured for the Buffalo waterfront are understood to have been deferred for six months in each case. A fair amount of small inquiry still is pending.

**Pittsburgh**—Reinforcing bar specifications are well sustained and compare favorably with the September volume. The market is 1.60c, Pittsburgh, with a slightly stronger tendency noted in quotations on attractive lots.

## Awards Compared

| | Tons |
|---|---|
| **Awards, week ended Oct. 24** | **12,195** |
| **Awards, week ended Oct. 17** | **14,001** |
| **Awards, week ended Oct. 10** | **2,434** |
| **Awards this week in 1930....** | **11,278** |
| **Av. weekly awards, 1930....** | **6,990** |
| **Av. weekly awards, 1931....** | **7,063** |
| **Av. weekly awards, Sept.....** | **6,672** |
| **Total awards to date, 1930..** | **312,724** |
| **Total awards to date, 1931** | **310,793** |

## Contracts Placed

2700 tons, rail steel, department of commerce building, Washington, D. C., to Kalman Steel Corp., Bethlehem, Pa.

2000 tons, federal warehouse, Washington, D. C., to Rosslyn Steel & Cement Co., Rosslyn, Va.

1500 tons, two government projects, Washington, to unstated, through McCloskey & Co., Philadelphia, contractors.

700 tons, dam and power plant, Ypsilanti, Mich., to McRae Steel Co., Detroit, through J. A. Utley, contractor.

600 tons, gymnasium, University of California, Los Angeles, to Pacific Coast Steel Corp., Los Angeles.

500 tons, Syracuse Lighting Co., addition, Syracuse, N. Y., to Buffalo producer.

375 tons, state highway, Uxbridge, Mass., to Northern Steel Co., Boston.

340 tons, parcel post building, New York, to McClintic-Marshall Corp., Bethlehem, Pa., through Corbetta Concrete Corp., contractor.

325 tons, highway and bridges, route 36, section 1, Keyport to Keansburg, N. J., to Heller Bros., Newark, N. J.

324 tons, postoffice, Wichita Falls, Tex., to Austin Bros., Dallas, Tex.; H. W. Underhill Construction Co., Dallas, contractor.

300 tons, Third street bridge, San Francisco, to Pacific Coast Steel Corp., San Francisco.

260 tons, bridge, Lehigh Valley railroad, Hillside, N. J., to Kalman Steel Corp., Bethlehem, Pa.

250 tons, hangars and post buildings, Mitchel Field, New York, to Concrete Steel Co., New York; tonnage in addition to 200 tons noted for the same project last week; Mowatt & Owens, Chicago, contractor.

250 tons, First street wing, Senate office building, Washington, D. C., to Concrete Steel Co., New York; George A. Fuller Co., contractor; 800 tons shapes still pending.

250 tons, high school, Elgin, Ill., to unstated fabricator.

250 tons, *Pomona-Progress* Bulletin building, Pomona, Calif., to unnamed interest.

230 tons, shops, Duncan field, San Antonio, Tex., to Concrete Engineering Co., Omaha, Nebr.

223 tons, highway work, San Luis Obispo county, Calif., to unnamed interest.

190 tons, bridge, Sheboygan, Wis., to Concrete Steel Co., New York.

190 tons, clinic building, veterans' hospital, Augusta, Ga., to Campbell Coal

(*Concluded on Page* 58)

# Bars

**Slight Increase in Demand Not Sufficient To Make a Trend—Small-Lot Buying Continues**

BAR PRICES, PAGE 53

**Chicago**—Gains in bar mill specifications during the last few days have not been of sufficient consequence to mark a trend. Increase of railroad shop activity in the West and modest resumption of implement production are encouraging. Two tractor makers, International Harvester Co., Chicago, and Caterpillar Tractor Co., Peoria, Ill., are operating three to four days a week. Some tillage tool and harvester equipment interests are going on a 25 per cent basis about Nov. 1. Several implement makers are reducing prices to stimulate business. Bar mill production averages 25 to 28 per cent. The extremely small orders are steadily adding to operating costs. Forgers and parts manufacturers are more cheerful over new car production, which promises to become effective Nov. 15 or Dec. 1. Less pressure on the 1.70c, base, quotation for soft steel bars is noted since the completion of most of the season's highway and public work projects. Alloy bar mills are gaining slightly.

**Philadelphia** — Commercial steel bars are unchanged at 1.60c, Pittsburgh. One leading seller reports October business is only slightly greater than for the corresponding period in September.

**Pittsburgh**—Bar orders are slightly heavier than in September, possibly about 10 per cent. Most of the increase from the automotive industry is not expected to be reflected in shipments until November. Demand from miscellaneous consumers is fairly steady but involves only small lots. The market is fairly well maintained at 1.60c, Pittsburgh.

**Cleveland** — Either 1.65c, Cleveland, or 1.60c, Pittsburgh, is applied to orders for merchant steel bars for outlying points, while 1.65c, Cleveland base, is the market on bars locally delivered. Specifications are continued on the restricted basis, little changed from recent weeks.

## Cold-Finished Demand Manifests Slight Upturn

Cold Finished Prices, Page 53

**Pittsburgh**—Little change is noted in cold-finished bar specifications and shipments. A slight improvement is shown in automotive requirements while a larger gain is anticipated for November in view of orders placed for releases next month. Buying in practically all cases calls for moderate lots. The market continues 2.10c, Pittsburgh.

**Cleveland**—Where automotive orders for cold-finished steel have been seasonally lagging, in spite of a fair number of specifications recently from them indirectly through their parts' makers, other consuming groups have issued some good-sized orders. The movement is running ahead of September. Cleveland base of 2.10c is without change.

## Tin Plate Contracting For Next Year Slow

Tin Plate Prices, Page 53

**Pittsburgh**—Tin plate specifications are fairly steady and operations are unchanged at the 40 per cent rate that has prevailed for the past several weeks. Several new contracts have been signed but most buyers are in no hurry to contract for next year and mills as yet have not started to roll material for shipment against new contracts. The market continues $4.75, Pittsburgh, per base box.

# Plates

**Specifications Slightly Heavier—Chicago Railroad Shop Orders Larger—Tank Work Quiet**

PLATE PRICES, PAGE 53

**Pittsburgh**—Plate shipments are light but releases are slightly heavier in some directions than a month ago. Little additional business in river equipment is noted although pending work remains fairly large. Tank work is quiet and little improvement is looked for in demands of railroad equipment builders. The general market remains 1.60c.

**New York**—Plate business remains spotty. Prices are easy at 1.70c, Coatesville, Pa., carlots. Patrick McGovern has closed on 450 tons of plate work for the Brooklyn water system to Alco Products Inc. Manufacturers of oil equipment have been specifying more actively.

**Philadelphia**—Plates in car lots usually are 1.70c, base, Coatesville, Pa., with concessions for larger orders. Demand is light.

**Cleveland**—Demand is comprised mainly of small orders, with the base price, 1.60c, Pittsburgh, firm. Considerable effort is required of mills, however, in figuring the large amount of varied-size inquiry that seemingly defies closing. Several local tank shops are booked up to insure steady daily operation. Several tank fabricators in this district were figuring on an unstated tonnage in several medium pressure tanks for General Electric Co., bids on which closed Oct. 24. Railroad plate needs were carried into fourth quarter on the basis of 1.60c, Pittsburgh.

Reconstruction of lake vessels preparatory to taking advantage of deeper channels being dredged in anticipation of a St. Lawrence seaway is expected to develop a good market for plates. It is also expected that reconstruction of dock and loading and unloading facilities also will stimulate demand for steel. There also is a trend toward converting lake freighters into self-unloaders. Deeper channels may put a premium on lake vessels, obsoleting small ones and possibly creating demand for larger units.

**Chicago**—Plate specifications have gained moderately in the last few days. Railroad shop orders are beginning to show more volume. The base price for plates is 1.70c, Chicago. News from the oil fields is quiet. About 500 tons of tank work has been let for the Oklahoma City fields. Municipal orders for waterworks have been holding up.

**Birmingham, Ala.**—The universal mill of Tennessee Coal, Iron & Railroad Co. started two years ago, is completed. Tank producers still are taking contracts for miscellaneous sizes, both bulk and filling station needs appearing weekly.

## Contracts Placed

140 tons, two tanks and standpipes for Seattle, Wash., to Western Engineering Corp., Seattle.

250 tons, book stacks for University of Southern California, Los Angeles, to Snead & Co., Los Angeles.

150 tons, two oil tanks and pipe line

for True's Oil Co., Tacoma, Wash., to Pittsburgh-Des Moines Steel Co.

## Contracts Pending

782 tons, ⅜ to ¾-inch plates, Bear Creek siphon, Hetch Hetchy project, San Francisco. Bids closed Oct. 23.
300 tons, stand pipe, Rocky Hill, Conn. Bids Nov. 2.

## Wire Movement Close to Rate in September

**Wire Prices, Page 53**

**Chicago**—October merchant wire products sales are about equal to September and only a shade above August. Manufacturers' wire orders still are down to the August level. Farm fencing sales are quiet. As little forward contracting is being done, prices are nominal at $1.90, Chicago or western mills, for wire nails to jobbers. Several contracts for manufacturers' wire have been closed at 2.25c. Wire mesh for road work is in smaller demand.

**Worcester, Mass.**—A slight improvement in inquiry and production has become apparent. Though slight, it is a real advance. Prices are holding at 2.30c, base, Worcester.

**Buffalo**—Wire mills are operating at 50 percent. During the busy season operations were at 75 per cent. In relation of output to capacity the past four or five months have been more satisfactory to wire and rod producers than to any other group and the slackening of trade at this season is regarded as normal.

**Pittsburgh**—New business in wire products is quiet, particularly in jobbing material. Occasional gains are noted in requirements of some users of manufacturers' wire but anticipatory purchases by jobbers during third quarter are deferring buying at this time. Prices consequently are provided little test, being fairly steady at $1.90, Pittsburgh, for wire nails. Plain wire continues 2.20c and wire rods $35.

**Cleveland**—Nail and wire sales improved last week over the period preceding, and October holds an increase over September. Inasmuch as jobbers ordered out their third-quarter contracts and inventories are impending, little in the way of ordering has come from that source. Attempts have been made to break the price structure but have not met with success, nails holding at $1.90 minimum to jobbers, $2.00 to the general trade. Wire is 2.20c and rods are quiet at $35 a ton.

Reda Pump Co., Bartlesville, Okla., has increased its capital stock to $323,000.

# Railroads

**Rail Purchases Most Active in Months—Santa Fe Buys 43,000 Tons—Inquiry Gains**

**TRACK MATERIAL PRICES, PAGE 53**

**New York**—Boston & Maine has placed an order for 10,000 tons of rails with Bethlehem Steel Co., Bethlehem, Pa. Fifteen thousand tons of rails for the Atlantic Coast Line have been placed among two mills. Several interests believe that 50,000 to 60,000 tons of rails, including the Atlantic Coast Line order, will be placed within the next ten days. Ten to twenty locomotives for the Lehigh Valley are again reported in an active state.

**Philadelphia**—Western Maryland railroad has awarded 1000 tons of rails to Bethlehem Steel Co., Bethlehem, Pa. Atlantic Coast Line is expected to purchase about 5000 tons of tie plates soon and 600 tons of 24-inch joint plates, to accompany its rail order of 15,000 tons.

**Pittsburgh**—Little new business in rails or fastenings is appearing and inquiries of most roads are not looked for for several weeks. Specifications against old orders also are light and unimproved since September. Orders for light rails are almost entirely lacking.

**Cleveland**—With the Chesapeake & Ohio rail order out of the way, the Erie's not expected for at least two months, Wheeling & Lake Erie's entry into the market for 1932 rails will be delayed until rolling has been completed on its 1931 order. Fastenings to accompany the Chesapeake & Ohio rails are still pending.

**Chicago**—Santa Fe railroad has awarded 43,000 tons of rails, 10,984 tons to Chicago district mills and 32,016 tons to a Colorado mill. With that order also goes 14,000 tons of track fastenings, allocated to the same mills. Reports have been out that Illinois Central shortly will be in the market for 20,000 to 30,000 tons of rails, but official word from that carrier is that no definite decision has been made.

Chicago & Illinois Midland railroad's letting of 750 freight cars—500 gondolas and 250 hopper cars—to Pullman Car & Mfg. Corp., will be partly repair work on old cars. This repair work will be extensive, some of the cars to be virtually rebuilt. Chicago, Milwaukee, St. Paul & Pacific has resumed operations at four of its shops located at Milwaukee, Minneapolis, Dubuque, Iowa, and Galewood, Ill., while Chicago, Rock Island & Pacific has returned a force of 400 at its Cedar Rapids, Iowa, locomotive shops.

## Car Orders Placed

Chicago & Illinois Midland, 750 rebuilt and new freight cars, 500 composite gondolas and 250 hoppers, to Pullman Car & Mfg. Corp., Chicago.

## Rail Orders Placed

Atchison, Topeka & Santa Fe, 43,000 tons, allocated as follows: 10,984 tons to Illinois Steel Co. and Inland Steel Co., Chicago, and 32,016 tons to Colorado Fuel & Iron Co., Pueblo, Colo.
Atlantic Coast Line, 15,000 tons, allocated as follows: 7500 tons each to Carnegie Steel Co., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.
Boston & Maine, 10,000 tons, to Bethlehem Steel Co., Bethlehem, Pa.
Western Maryland, 1000 tons, to Bethlehem Steel Co., Bethlehem, Pa.

## Locomotives Pending

Lehigh Valley, 10 to 20 locomotives; inquiry again reported active.

## Rail Orders Pending

Atlantic Coast Line, about 5000 tons tie plates, fastenings to accompany 15,000 ton rail order.
Illinois Central, 20,000 to 30,000 tons; no definite inquiry out, but purchase expected.

## Lake Iron Ore Movement To Close About Nov. 15

**Iron Ore Prices, Page 67**

**Cleveland**—The vessel movement of Lake Superior iron ore will be practically ended for the season by Nov. 15, according to shippers' present plans. United States Steel Corp.'s vessel subsidiary will have most of its boats out of the ore trade by that date, and large independents also contemplate early closing, with the total movement for the season now estimated at 25,000,000 tons. The Lake Superior Iron Ore association reports the following data on consumption and stocks:

| | Tons |
|---|---|
| Ore consumed in August | 1,652,247 |
| Ore consumed in September | 1,470,219 |
| Decrease in September | 182,028 |
| Ore consumed in September, 1930 | 3,281,573 |
| Ore on hand at furnaces Oct. 1, 1931 | 31,997,995 |
| Ore on Lake Erie docks Oct. 1, 1931 | 5,973,654 |
| Total at furnaces and Lake Erie docks Oct. 1, 1931 | 37,971,649 |
| Total Oct. 1, 1930 | 38,366,056 |

## Concrete Bars Placed

(*Concluded from Page* 55)

Co., Atlanta, Ga., and Concrete Steel Co., New York; J. S. McCauley & Co., Atlanta, contractor.

173 tons, protective work along Los Angeles river, Los Angeles, to Concrete Engineering Co., Omaha, Nebr.

120 tons, sewage treatment plant, Princeton, N. J., to Kalman Steel Corp., Bethlehem, Pa.; Engstrom & Wynn Inc., Wheeling, W. Va., contractor.

115 tons, Mellon institute building, Pittsburgh, to Kalman Steel Corp., Bethlehem, Pa.

105 tons, overpass and bridge, Runnels county, Texas, to Austin Bros., Dallas, Tex.; D. F. Jones Construction Co., Little Rock, Ark., contractor.

100 tons, postoffice, Pawtucket, R. I., to Truscon Steel Co., Youngstown, O., through E. S. Moore & Son, Kokomo, Ind.

100 tons, courthouse, San Jose, Calif., to W. S. Wetenhall Co., San Francisco.

100 tons, four hangars and other buildings, Barksdale field, Shreveport, La., to North Texas Iron & Steel Co., Fort Worth, Tex.; 2500 square yards mesh, to Truscon Steel Co., Youngstown, O., and Wickwire-Spencer Steel Co., Buffalo; W. M. Werner, Shreveport, La., contractor.

Unstated tonnage, 2600 square feet, welded wire fabric, naval aircraft factory, Philadelphia, to Consolidated Expanded Metal Co., Wheeling, W. Va.; bids of Oct. 8.

## Contracts Pending

900 tons, buildings, Harlem Valley hospital, Wingdale, N. Y.

825 tons, superstructure, west side elevated highway, Twenty-second to Thirty-eighth street, New York; bids in about one month; president, borough of Manhattan.

500 tons, piers, New York.

500 tons, apartment building, Chicago; S. Menchen, architect.

450 tons, sewage disposal plant, Yonkers, N. Y.

400 tons, postoffice, Oak Park, Ill.; Weber & White, Chicago, architects.

325 tons, state highway bridges, Massachusetts.

310 tons, school for blind, Berkeley, Calif.; bids being taken.

300 tons, foundations, dirigible hangar, Sunnyvale, Calif.; Raymond Concrete Pile Co., New York, contractor.

242 tons, state bridges, Kinney and Val Verde counties, Texas.

240 tons, pier, Brooklyn, N. Y., readvertised.

200 tons, bridge, Cuyahoga county, O., North Woodland road over Chagrin river; bids Oct. 30. Included, 50 tons sheet steel piling.

200 tons, Van Sciver Co. store, Trenton, N. J.; William Steele & Sons Co., Philadelphia, low on general.

200 tons, pile caps and foundation walls, Franklin institute, Philadelphia; Carter Paving Co., contractor.

190 tons, Mono Lake bridge, Muskegon, Mich.; H. E. Culbertson Co., Cleveland, contractor.

190 tons, Goldberg Arcade building, Oak Park, Ill.

150 tons, postoffice, Aurora, Ill.

100 tons, piers, Michigan avenue bridge, Buffalo; bids soon by City of Buffalo.

100 tons, highway work, Monterey county, Calif.; bids opened.

Unstated tonnage, reservoir, Parma village, Cleveland; plans out.

Unstated tonnage, foundation, Thirtieth street postoffice, Philadelphia; James Gow, Fifteenth and Locust streets, Philadelphia, low.

Unstated tonnage, caissons, repairs to Hanover street bridge, Baltimore; Victor Piles, Baltimore, contractor.

## Semifinished Quiet; More Forging Billets Sold

**Semifinished Prices, Page 67**

**Pittsburgh**—Finishing mills show little change in their requirements of billets and sheet bars and new busine s in these materials continue at a quiet rate. Demand for forging billets is a shade better than in September with the market usually $35. Rerolling billets, slabs and sheet bars are $29, with wire rods $35.

**Youngstown, O.**—Few sales of billets, slabs and sheet bars are being made by local producers. Billets, slabs and sheet bars bring $29, Youngstown and Pittstburgh.

# Pipe

**Start Construction on First Gasoline Pipe Line—New York Will Buy 2900 Tons Cast Pipe**

**PIPE PRICES, PAGE 71**

**New York**—Department of water supply, gas and electricity is in the market for approximately 2900 tons of cast pipe. General contract figures are being taken on about 3000 tons up-tate. Prices on small lots are firmer, but under $30, eastern foundry prevails on the bulk. Pennsylvania railroad is taking bids Nov. 5 on an unstated tonnage of steel pipe.

**Chicago**—About 700 tons has been placed in Illinois cities for extensions due to the natural gas flow from Texas through the Continental Construction Co. Texas-Chicago line. Pressure pipe prices hold at $35 to $36, Birmingham, for small orders, but prices are shaded $1 to $2 a ton for most attractive private business.

**Boston**—Cast pipe inquiry and sales are light, as low as $28, foundry being noted on some recent business. Construction has started on the first gasoline carrying pipe line, a 100-mile section connecting Providence, Worcester and Springfield, branching at Douglas, a Standard Oil Co. project. Steel pipe was placed for the line some months ago.

**Pittsburgh**—Tubular products are in unchanged demand. Unfilled orders for line pipe are being depleted and operations are declining at a corresponding rate.

## Steel Pipe Pending

6500 tons, Pennsylvania railroad development along Schuylkill river, Philadelphia. Two contracts: No. 13 just awarded to F. A. Canuso & Son, Philadelphia, involving 3500 tons; contract No. 12, involving balance, to Frederick Snare, New York.

150 tons, caissons, repairs to Hanover street bridge, Baltimore; Victor Piles, Baltimore, contractor.

Unstated tonnage, line from Montana, Wyoming, through Oregon and Washington to British Columbia, for International Utilities Corp., 150 Broadway, New York. Pipe expected to cost $8,000,000, entire project, $30,000,000, bond issue for this amount having been underwritten in New York. Work expected to begin this winter.

Unstated tonnage, Pennsylvania railroad; bids Nov. 5.

## Cast Pipe Placed

1361 tons, Oakland, Calif., for East Bay municipal water district, allocated as follows: To National Cast Iron Pipe Co., Birmingham, Ala., 1077 tons 4 to 8-inch class 150; and to Pacific States Cast Iron Pipe Co., Provo, Utah, 284 tons, 4 and 8-inch class 150.

400 tons, various sizes, Dallas, Tex., to United States Pipe & Foundry Co., East Burlington, N. J.

200 tons, miscellaneous sizes for Chicago sanitary district, to Glamorgan Pipe & Foundry Co., Birmingham, Ala.

200 tons, 6, 8, 12, 16 and 30-inch monocast, for filtration plant, Eugene, Oreg., to American Cast Iron Pipe Co., Birmingham, Ala.

139 tons, 4 to 8-inch class B, Anaheim, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, 8 and 10-inch monocast, for B. B. Orchard Co., Wenatchee, Wash., to American Cast Iron Pipe Co., Birmingham, Ala.

## Cast Pipe Pending

2000 tons, 12 and 24-inch, Brooklyn, N. Y., bids Oct. 27, department of water supply, gas and electricity.

900 tons, 30-inch, Manhattan, for installation on South street, bids Oct. 30, department of water supply, gas and electricity.

600 tons, 4 to 10-inch with fittings, Cicero, N. Y.; bids Nov. 2.

500 tons, miscellaneous cast sizes, sewage treatment works, Ft. Wayne, Ind.

500 tons, up to 30-inch, Washington; United States Pipe & Foundry Co., East Burlington, N. J., low at $36.40.

350 tons, 2 to 12-inch cast, Bethel, O.; project being readvertised.

300 tons, 4 to 6-inch cast, Williamsburg, O.; bids soon.

215 tons, 4 to 12-inch class 150, improvement Foothill boulevard, Arcadia, Calif.; bids opened.

159 tons, 2 to 8-inch class 150, Mesa, Ariz.; bids opened.

100 tons, 4-inch, Worthington, Mass.

# Strip

**Improved Demand Slow to Develop—October Only Slightly Better—Prices Holding Well**

STRIP PRICES, PAGE 53

**Pittsburgh**—Strip steel shipments are slightly ahead of the September rate and automotive orders and inquiry point to moderately better operations in November. The improvement in automotive demand for October shipments so far has been light and operations continue around 20 per cent for hot mills and slightly less for cold mills. Prices generally are steady at 1.55c and 1.65c for hot strip and 2.15c to 2.25c for cold-rolled strip.

**New York**—Strip buying continues dull. Some sellers report a slight gain over the corresponding period a month ago, but the improvement generally is slight. Hot-rolled strip is 1.55c and 1.65c, Pittsburgh, and cold-rolled, 2.15c, Pittsburgh.

**Philadelphia**—While better business in steel strip is regarded as likely to develop it has not yet appeared. Prices remain at 1.55c and 1.65c, Pittsburgh, for hot-rolled and 2.15c on cold.

**Youngstown, O.**—Some disappointment is felt in the slowness with which auto partsmakers cover November and December needs. Most of today's specifications for strip are from miscellaneous sources. Quotations are declared to be firm on all gages and widths.

**Cleveland**—Inquiry in one and two carload lots is developing, a little larger, but sales are not increasing and bookings are holding closely to the September rate. No concessions are apparent in the 1.55c and 1.65c, Pittsburgh, base, on wide and narrow hot-rolled; 2.15c, Cleveland, is minimum on cold-rolled.

**Chicago**—Cold-rolled strip makers in this district feel more hopeful as to the production of new automobile models for next year, although it is felt benefits from the increased schedules will not be effective until Nov. 15 or Dec. 1. No new contracts are being made and the quotation of 2.15c, Pittsburgh-Cleveland, is nominal. Operations are 20 to 25 per cent.

## Operations at 27 Per Cent Are Low for Year

**Youngstown, O.**—Steel operations for the week ended Oct. 24 averaged 24 per cent capacity, down six points from last week, but a moderate gain in the last few days offsetting an earlier dip to the 23 per cent level. The outlook for the current week is uncertain but a fair advance in ingot production seemed more likely than a further drop. During the first half of last week operations were at the lowest level of the year. On Oct. 24 17 open-hearth furnaces of 66 were melting and tentative schedules indicated the same number would be active the first half of this week. Republic Steel, which resumed operations at several open hearths and a blast furnace in Youngstown on Oct. 22 is averaging 32 per cent while Carnegie Steel Co. mills are holding at 45 per cent. Both Youngstown Sheet & Tube Co. operations and Sharon Steel Hoop are averaging 20 per cent.

| | Per Cent |
|---|---|
| Operations, week ended Oct. 24 | 27 |
| Operations, week ended Oct. 17 | 28 |
| Operations, week ended Oct. 10 | 29 |
| Operations, this week, 1930 | 49 |
| High for 1931 (March 19) | 57 |
| Low for 1931 (Oct. 24) | 27 |

**Philadelphia**—Steel production in eastern mills is off a fraction of a point this week to 28-29 per cent capacity, against 29 last week. A leading mill here is at slightly under 30 per cent.

**Pittsburgh**—Operations generally are unchanged with ingot output around 25 per cent this week; blast furnace schedules unchanged at 11 active steelworks stacks of 54. Sheet production continues at 30, tin plate at 40, strip is unchanged at 20 with pipe 25 to 30 per cent.

**Buffalo**—Steelworks operations are taking a five-point drop this week after holding at 40 per cent capacity during the week ending Oct. 24. Staggered operations are responsible. Production calls for 12 of 37 open hearths active this week.

**Cleveland**—Ingot production ended last week at a steady 35 per cent rate, involving 12 active open hearths of 34, at the same rate as when the week opened. Every indication is given that this rate is to be continued into this week. Each of the individual plants' rate is likewise without change.

**Chicago**—Ingot production again is on a lower schedule. Open-hearth production this week will be slightly under 25 per cent, as against 26 per cent a week ago. Active steelworks blast furnaces total nine of 36, as the recently banked Joliet furnace has been returned in blast. Finishing mill operations average about 28 per cent.

**Birmingham, Ala.**—A two-point gain is noted in steel operations, based on ingot production, to 30 per cent capacity. Gulf States Steel Co. has three open-hearth furnaces in operation.

## Warehouse Gains Spotty; But October Average Better

Warehouse Prices, Page 71

**New York**—Volume is practically unchanged, the October pickup being below that of normal years. Prices are holding on small orders. Several promising ventilating contracts for state and New York city buildings offer a fair tonnage of sheets.

**Philadelphia**—Trading is dull with a likelihood October will show little gain over September. Prices are unchanged.

**Detroit**—Demand holds improved over September, though day-to-day sales are irregular and this month's increase has been slight. Die shops are active. Quotations on steel products from stock are unchanged.

**Cincinnati**—Effective immediately base quotations on nails are changed, 10 to 49 kegs at $2.65, larger quantities at $2.50, both a 10-cent increase. Quotation on one to nine kegs is unchanged at $2.80. Warehouse demand continues steady.

**Pittsburgh** — Despite occasional slight gains in sales total business is little changed from the slow September activity. Small-lot orders predominate. Prices are unchanged.

**Cleveland**—Movement of iron and steel from warehouses in this district has shown a slight upturn so far in October. Demand is coming from a wide range of sources and involves a diversity of material. Prices hold firm.

**St. Louis**—Further slight betterment in demand is reported by several leading distributors. A moderate broadening in takings by the general manufacturing trade is noted and some larger buying interests are also showing more interest.

Sheet and plate metalworking machinery exported to the United Kingdom last June was valued at $96,680.

*Model 24-P ejection type press, having box 100" long, 20" wide, 42" deep. Finished bales measure 20" x 14" x 14" minimum. Can be equipped with power operated loading hopper*

# LOGEMANN SCRAP METAL PRESSES

**Hydraulically compressed scrap commands at all times the *best price,* and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.**

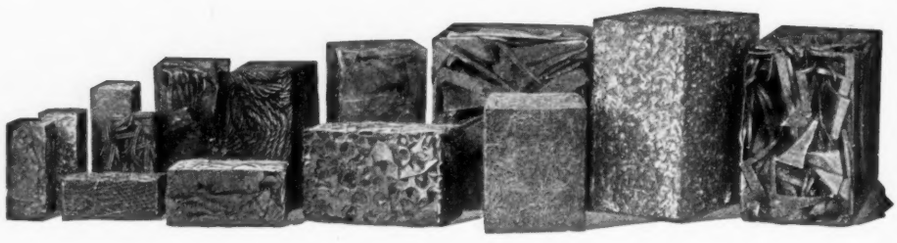
***LOGEMANN Presses*** **are built in several types and sizes to suit all requirements.**

***You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.***

## PIONEERS!

**LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metal-working establishments of all kinds.**

**Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.**



**LOGEMANN BROTHERS COMPANY, 3126 Burleigh St., MILWAUKEE, WIS.**

# Scrap

**Little Change in Conditions, Spot Buying, Restricted Shipments Ruling—Prices Nominal**

**Chicago**—Preparations are being completed to ship 3000 to 4000 tons of cast borings to the Buffalo market about Nov. 5. The steel scrap market has been stimulated moderately by easing tight restrictions against shipments to a large melter of steelmaking grades. Shipments have resumed a more liberal basis, as a result. The Gary melter continues to take shipments at the usual rate. No new orders for heavy melting steel have been closed, the last sale having been at $8.25. No inquiry exists for cast foundry grades, except for shipment outside the district.

**Boston**—Little heavy melting steel is moving although supplies are not large. Movement of other grades is also light. Turnings and borings are weak and some have been sold at low

# Iron and Steel Scrap Prices

**Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated**

### HEAVY MELTING STEEL

| | |
|---|---|
| Birmingham | 7.00 to 8.50 |
| Boston, dealers | 4.10 to 4.60 |
| Buffalo, No. 1 | 9.00 to 9.50 |
| Buffalo, No. 2 | 7.75 to 8.25 |
| Chicago | 7.75 to 8.25 |
| Cinci., deal. | 7.25 to 7.75 |
| Cleve., No. 1 | 8.50 to 9.00 |
| Cleve., No. 2 | 7.50 to 8.00 |
| Det., No. 1 deal. | 6.00 to 6.50 |
| Det., No. 2 deal. | 5.00 to 5.50 |
| E. Pa. del. mill | 7.50 to 8.50 |
| N. Y. deal. R. R. | 5.00 to 6.25 |
| N. Y. deal. No. 2 | 3.50 to 4.00 |
| N. Y. deal. yd. | 4.00 to 4.50 |
| Pitts. No. 1 | 10.00 to 10.50 |
| St. L. No. 1 sel. | 8.00 to 8.20 |
| Federal, Ill. | 7.50 to 8.00 |
| Granite City, Ill. | 7.00 to 7.50 |
| Valleys, No. 1 | 9.25 to 9.75 |

### COMPRESSED SHEETS

| | |
|---|---|
| Buffalo, dealers | 7.75 to 8.25 |
| Chi., (Factory) | 7.00 to 7.50 |
| Cleveland | 7.50 to 7.75 |
| Detroit, dealers | 6.00 to 6.50 |
| E. Pa. new mat. | 8.00 to 9.00 |
| Pittsburgh | 9.75 to 10.25 |
| Valleys | 8.75 to 9.25 |

### BUNDLED SHEETS

| | |
|---|---|
| Buffalo | 5.50 to 6.00 |
| Cinci., deal. | 6.75 to 7.25 |
| Cleveland | 6.50 to 7.00 |
| Eastern Pa. | 6.50 to 7.00 |
| Pittsburgh | 9.50 to 10.00 |
| St. Louis | 3.50 to 4.00 |

### SHEET CLIPPINGS LOOSE

| | |
|---|---|
| Chicago | 3.75 to 4.25 |
| Cincinnati | 4.00 to 4.50 |
| Detroit, dealers | 3.50 to 4.00 |
| St. Louis | 3.50 to 4.00 |

### STEEL RAILS SHORT

| | |
|---|---|
| Birmingham | 11.00 to 12.00 |
| Boston, dealers | 3.10 to 4.60 |
| Buffalo | 12.00 to 12.50 |
| Chicago (3 ft.) | 10.00 to 10.50 |
| Chicago (2 ft.) | 10.75 to 11.25 |
| Cinci., deal. | 12.50 to 13.00 |
| Detroit, deal. | 11.00 to 11.50 |
| Pitts. (open-hearth, 3 ft. and less) | 12.50 to 13.00 |
| St. Louis | 12.00 to 12.50 |

### STOVE PLATE

| | |
|---|---|
| Birmingham | 6.50 to 7.00 |
| Boston, con. | 5.00 to 5.50 |
| Buffalo | 8.25 to 8.75 |
| Chicago, net | 6.00 to 6.50 |
| Cinci., deal. net | 4.50 to 5.00 |
| Det., net deal. | 4.00 to 4.50 |
| Eastern Pa. | 7.50 to 8.00 |
| N. Y., deal. mill | 4.75 to 5.50 |
| St. Louis | 6.50 to 7.00 |

### COUPLERS, SPRINGS

| | |
|---|---|
| Buffalo | 11.00 to 11.50 |
| Chicago | 9.25 to 9.75 |
| Eastern Pa. | 13.00 |
| Pittsburgh | 11.00 to 11.50 |
| St. Louis | 8.50 to 9.00 |

### ANGLE BARS—STEEL

| | |
|---|---|
| Chicago | 9.25 to 9.75 |
| St. Louis | 7.50 to 8.00 |

### LOW PHOSPHORUS

| | |
|---|---|
| Buffalo, billets and bloom crops | 12.00 to 12.50 |
| Cleveland bil. and bloom crops | 12.00 to 12.50 |
| Eastern Pa. | 13.50 to 14.00 |
| Pittsburgh billet bloom crops | 14.00 to 14.50 |
| Pitts. sheet bar crops | 13.00 to 13.50 |

### FROGS, SWITCHES

| | |
|---|---|
| Chicago | 8.50 to 9.00 |
| St. Louis | 8.50 to 9.00 |

### SHOVELING STEEL

| | |
|---|---|
| Chicago | 7.75 to 8.25 |
| Cleveland | 6.50 to 7.00 |
| St. Louis | 7.50 to 8.00 |

### RAILROAD WROUGHT

| | |
|---|---|
| Birmingham | 7.50 to 8.00 |
| Boston, dealers | 8.00 to 8.50 |
| Buffalo, No. 1 | 7.00 to 7.50 |
| Buffalo, No. 2 | 9.00 to 9.50 |
| Chicago, No. 1 | 8.00 to 8.40 |
| Chicago, No. 2 | 7.75 to 8.25 |
| Cinci., No. 2 | 7.25 to 7.75 |
| Eastern Pa. | 9.50 |
| N. Y., No. 1, deal. | 9.00 to 9.50 |
| Pitts., No. 2 | 10.00 to 10.50 |
| St. Louis, No. 1 | 5.00 to 5.50 |
| St. Louis, No. 2 | 7.50 to 8.00 |

### SPECIFICATION PIPE

| | |
|---|---|
| Boston | 4.00 to 4.25 |
| Eastern Pa. | 9.50 to 10.00 |
| N. Y., deal. | 5.00 to 5.50 |

### BUSHELING

| | |
|---|---|
| Buffalo, No. 1 | 7.75 to 8.25 |
| Chicago, No. 1 | 6.50 to 7.00 |
| Cinn., No. 1 dl. | 6.00 to 6.50 |
| Cinn., No. 2 | 3.50 to 4.00 |
| Cleve., No. 2 | 6.25 to 6.75 |
| Det., No. 1 new deal. | 5.00 to 5.50 |
| St. L., No. 1 | 6.00 to 6.50 |
| Val. new No. 1 | 8.75 to 9.25 |

### MACHINE TURNINGS

| | |
|---|---|
| Birmingham | 3.50 to 4.00 |
| Boston, dealers | 1.75 to 2.00 |
| Buffalo | 4.75 to 5.25 |
| Chicago | 4.25 to 4.75 |
| Cinn., deal. | 3.75 to 4.25 |
| Cleveland | 5.00 to 5.50 |
| Detroit | 3.50 to 4.00 |
| Eastern Pa. | 5.00 to 5.50 |
| N. Y., deal. | 2.00 to 2.50 |
| Pittsburgh | 7.00 to 7.50 |
| St. Louis | 3.00 to 3.50 |
| Valleys | 6.75 to 7.25 |

### BORINGS AND TURNINGS For Blast Furnace Use

| | |
|---|---|
| Boston | 1.50 to 1.75 |
| Buffalo | 6.00 to 6.50 |
| Cinn., deal. | 4.50 to 5.00 |
| Cleveland | 6.50 to 7.00 |
| Detroit, deal. | 4.50 to 5.00 |
| Eastern Pa. | 5.50 |
| N. Y., deal. | 2.00 to 2.50 |
| Pittsburgh | 7.25 to 7.75 |

### CAST IRON BORINGS

| | |
|---|---|
| Birming., chem. | 12.50 to 13.00 |
| Birming., plain | 3.50 to 4.00 |
| Boston, chem. | 7.00 to 7.25 |
| Boston, deal. | 1.50 to 1.75 |
| Buffalo | 6.00 to 6.50 |
| Chicago | 4.00 to 4.50 |
| Cinn., deal. | 3.75 to 4.25 |
| Cleveland | 6.50 to 7.00 |
| Detroit, deal. | 4.50 to 5.00 |
| Eastern Pa. | 5.00 to 6.00 |
| E. Pa., chem. | 10.50 to 12.00 |
| N. Y., deal. | 2.00 to 2.50 |
| Pittsburgh | 7.50 to 8.00 |
| St. Louis | 5.50 to 6.00 |

### PIPE AND FLUES

| | |
|---|---|
| Cinn., deal. | 6.00 to 6.50 |

### RAILROAD GRATE BARS

| | |
|---|---|
| Buffalo | 6.50 to 7.00 |
| Chicago, net | 5.75 to 6.25 |
| Cincinnati | 5.50 to 6.00 |
| Eastern Pa. | 7.50 to 8.00 |
| N. Y., deal. | 5.00 to 5.50 |
| St. Louis | 6.00 to 6.50 |

### FORGE FLASHINGS

| | |
|---|---|
| Boston, deal. | 5.00 to 5.25 |
| Buffalo | 7.50 to 8.00 |
| Cleve. ov. 10 in. | 7.00 to 7.50 |
| Detroit | 5.00 to 5.50 |

### FORGE SCRAP

| | |
|---|---|
| Boston, del. | 2.00 to 2.25 |
| Chicago | 11.00 to 11.50 |
| Eastern Pa., del. | 8.00 to 8.50 |

### ARCH BARS, TRANSOMS

| | |
|---|---|
| Chicago, net | 9.00 to 9.50 |
| St. Louis | 7.75 to 8.25 |

### AXLE TURNINGS

| | |
|---|---|
| Boston, deal. | 6.75 to 7.00 |
| Buffalo | 7.50 to 8.00 |
| Chi., steelworks | 7.00 to 7.50 |
| Cleveland | 6.75 to 7.00 |
| Eastern Pa., del. | 7.50 to 8.50 |
| Pittsburgh | 9.00 to 9.50 |
| St. Louis | 6.50 to 7.00 |

### STEEL CAR AXLES

| | |
|---|---|
| Birmingham | 11.50 to 12.00 |
| Boston, ship. pt. | 11.00 to 12.00 |
| Buffalo | 12.00 to 12.50 |
| Chicago | 12.90 to 13.45 |
| Eastern Pa. | 17.00 to 18.00 |
| St. Louis | 11.50 to 12.00 |

### SHAFTING

| | |
|---|---|
| Bos., ship. pt. | 10.00 to 10.50 |
| Chicago | 8.95 to 9.50 |
| N. Y., deal. | 9.00 to 9.50 |
| St. Louis | 9.00 to 9.50 |
| E. Penna. | 16.00 |

### CAR WHEELS

| | |
|---|---|
| Birming. iron | 8.50 to 9.00 |
| Boston, iron | 14.00 to 14.50 |
| Buffalo, iron | 10.00 to 10.50 |
| Buffalo, steel | 10.50 to 11.00 |
| Chicago, iron | 9.50 to 10.00 |
| Chi. rolled steel | 9.50 to 10.00 |
| Cincinnati, iron | 9.50 to 10.00 |
| E. Pa. steel | 10.50 to 11.00 |
| E. Pa. iron | 12.50 to 13.00 |
| Pitts. iron | 10.00 to 10.50 |
| Pitts., steel | 11.00 to 11.50 |
| St. Louis, iron | 7.00 to 7.50 |
| St. Louis, steel | 8.50 to 9.00 |

### NO. 1 CAST SCRAP

| | |
|---|---|
| Birmingham | 8.50 to 9.00 |
| Buffalo (mach.) | 10.25 to 10.75 |
| Boston, textile | 10.00 to 10.50 |
| Chicago, mach. | 9.80 to 10.35 |
| Chi., railroad | 8.70 to 9.25 |
| Chicago, agri. | 8.40 to 8.95 |
| Cinn., mach. cup., gross | 12.25 to 12.75 |
| Cleve. cupola | 10.00 to 10.50 |
| Det., net deal. | 8.00 to 8.50 |
| E. Pa., cupola | 12.50 to 13.00 |
| N. Y. cup. deal. | 7.00 to 7.50 |
| N. Y., del. local foundries | 12.00 |
| Pitts., cupola | 10.00 to 10.50 |
| San Fran., del. | 13.50 to 14.00 |
| Seattle | 5.00 to 7.50 |
| St. L. No. 1 ma. | 8.50 to 9.00 |
| St. L. No. 1 | 7.50 to 8.00 |

### HEAVY CAST

| | |
|---|---|
| Boston | 10.50 to 11.00 |
| Bos. mach. cast. | 11.50 to 12.50 |
| Buffalo, break | 6.75 to 7.25 |
| Cleve., break | 6.00 to 6.50 |
| Detroit, auto, net deal. | 10.50 to 11.00 |
| Det., break., dl. | 5.50 to 6.00 |
| Eastern Pa. | 9.50 to 10.00 |
| N. Y., break, dl. | 6.00 to 6.50 |
| N. Y. No. 1 dl. | 7.00 to 7.50 |
| Pittsburgh | 8.00 to 8.50 |

### MALLEABLE

| | |
|---|---|
| Boston R. R. | 13.00 to 13.50 |
| Buffalo | 10.00 to 10.50 |
| Chicago, agri. | 8.00 to 8.50 |
| Chicago, R. R. | 8.50 to 9.00 |
| Cinci., R. R. del. | 10.25 to 10.75 |
| Cinci., agri. del. | 10.00 to 10.50 |
| Cleveland, rail | 10.00 to 10.50 |
| Det. auto deal. | 9.50 to 10.00 |
| St. Louis, rail | 6.75 to 7.25 |

### RAILS FOR ROLLING 5 feet and over

| | |
|---|---|
| Birmingham | 10.50 to 11.00 |
| Boston | 7.50 to 8.00 |
| Buffalo | 10.00 to 10.50 |
| Chicago | 10.50 to 11.00 |
| Eastern Pa. | 11.50 to 12.00 |
| New York | 6.25 to 6.75 |
| St. Louis | 10.50 to 11.00 |

### LOCOMOTIVE TIRES

| | |
|---|---|
| Chicago, cut | 11.00 to 11.50 |
| St. L., No. 1 | 9.00 to 9.50 |

### LOW PHOS. PUNCHINGS

| | |
|---|---|
| Chicago | 11.00 to 11.50 |
| Buffalo | 12.00 to 12.50 |
| Eastern Pa. | 13.00 to 14.00 |
| Pittsburgh | 13.00 to 13.50 |

prices rather than to go into storage. Heavy breakable cast has been sold close to $5, f.o.b., for shipment outside New England.

**New York**—Scrap prices are unchanged. Bulk of No. 1 heavy melting steel is moving to Buffalo by barge. Breakable cast is fairly active, Florence, N. J., and Pencoyd, Pa., paying $9.50 delivered. Phoenixville, Pa., is taking limited shipments, volume generally light.

**Philadelphia**—Further purchases of heavy melting steel by Bethlehem Steel Co. for delivery at Bethlehem, Pa., brings the week's total for that plant to 2000 tons, all at $7.50, delivered, with some tonnage at the same price for delivery at Sparrows Point, Md. In general demand is dull and prices are unchanged.

**Pittsburgh**—Continued quiet in mill purchases of iron and steel scrap holds down activity. Prices, tested on only small lots generally, are steady.

## Canadian Scrap

**Dealers' Buying Prices**

Per Gross Ton

**MONTREAL**

| | |
|---|---|
| Iron axles | $11.00 |
| Steel axles | 10.00 |
| Car wheels | 8.00 |
| Stove plate | 8.00 |
| Wrought pipe | 2.00 |
| Turnings | 2.00 |
| Heavy melting steel | 6.00 |

**TORONTO**

| | |
|---|---|
| Steel axles | 7.00 |
| Iron axles | 7.00 |
| Heavy melting steel | 7.00 |
| Turnings | 2.00 |
| No. 1 mach. cast (net) | 9.00 |
| Malleable (net) | 7.00 |

Heavy melting steel continues $10 to $10.50 with little tonnage being picked up by dealers at less. Hydraulic compressed sheets, however, are easier at $9.75 to $10.25. Blast furnace grades are quiet and unchanged. No immediate improvement in mill buying is in prospect based on the current and prospective rate of operations.

**Buffalo**—Consumers have succeeded in buying additional tonnage of No. 1 heavy melting steel at $9. Bethlehem is named as the buyer of new tonnage, estimated at 1000 to 2000 tons during the past week. Other materials are inactive.

**Cleveland**—The recent reduction in the prices of heavier grades of iron and steel scrap in the Youngstown district by 50 cents to $1 a ton has not affected the Cleveland scrap quotations, which have been merely nominal for many weeks.

**Detroit**—Borings and turnings have weakened further and a decline of 25 cents per ton is registered on all grades. Recent lists from producers brought lower prices than preceding offers.

**Cincinnati**—Small-lot buying of scrap comprises the sole activity, with shipments against contracts remaining restricted. Prices, although nominal, are fairly steady, with an occasional bargain lot having relatively little influence on quotations.

**St. Louis**—Iron and steel scrap continues to mark time. Consumer buying is at a minimum and dealers have pared down their orders until they are buying little. Small fill-in tonnages are being picked up by gray iron and malleable jobbing plants. The total of these sales, however, is insignificant and practically all transactions call for prompt shipment.

**Birmingham, Ala.**—No speculation is noted in iron and steel scrap. It is a matter of immediate needs. The market is still slow and prices weak.

**Toronto, Ont**—Conditions in general are unchanged in the iron and steel scrap market. Mills are out of the market for old material and there is little demand for heavy melting steel, turnings or other lines of steel scrap. Foundries are reducing operations and taking in smaller quantities of iron scrap. Occasional orders are appearing for machinery cast and stove plate, but otherwise dealers find no activity.

## Bolts, Nuts, Rivets Show Slight Gain in Volume

**Bolts, Nuts, Rivets Prices, Page 53**

**Pittsburgh**—What change is noted in specifications for bolts, nuts and rivets is for the better although gains in requirements of most consumers are slight. Railroads continue light buyers and structural shops are slightly less active. Rivet prices are steady at 2.25c, Pittsburgh, for structural rivets with bolts and nuts usually 73 and 10 off.

**Cleveland**—Better orders for bolts and nuts from automobile plants, especially in the Chevrolet purchase, increased last week's sales over those of the week prior. However, jobbers' orders are diminished, reflecting the approaching inventory period. Prices are unchanged on bolts, nuts and rivets.

**Chicago** — Resumption of several tractor makers at about 25 per cent is of help to the bolt, nut and rivet market. Specifications continue a shade above September. Bolts and nuts are weak at 73 and 10 off, while small rivet discounts remain at 70, 10 and 5 off.

**Philadelphia**—Bolts and nuts are easy. Concessions under 73 and 10 off have not become general. Trading is light. Rivets are steady at 2.25c, Pittsburgh.

## Coke

**Moderate Increase in Shipments Noted—Domestic Grades More in Demand—Prices Are Steady**

**COKE PRICES, PAGE 67**

**Pittsburgh**—Coke shipments hold moderately ahead of the September rate, most of the gain being limited to the domestic grade. Water gas producers are taking slightly larger shipments of furnace coke but foundry demand shows little change. Spot prices are fairly steady at $2.40 for standard furnace coke, and $3.25 to $4.50 for foundry grade.

**Boston**—Foundry coke demand is unchanged, buying being light and close to actual needs. Prices are steady at $10.50, New England.

**New York**—Demand for metallurgical coke is showing little improvement, with prices unchanged. Beehive furnace coke is $2 to $2.25, Connellsville, Pa., and foundry coke, $3 to $3.25, Connellsville, for the ordinary grades, and $4.50, Latrobe, Pa., for premium brands. By-product foundry coke is $8.70 to $9.10, Newark, N. J., $10.50, New England; and $8.75, Philadelphia.

**Cincinnati**—Shipments of by-product foundry coke continue near the September level. Two exceptions, anticipating needs well into 1932, mark the general resistance to future contracting. Prices are unchanged.

**St. Louis**—New orders are limited to actual early requirements. Thus far there is little evidence of consumers acquiring stocks for the early winter months, except in a few instances in the West and Southwest.

**Birmingham, Ala.**—Coke consumers are purchasing small quantities and getting deliveries promptly with the exception of domestic coke, prices being firm.

American QUALITY Steel & Wire Company

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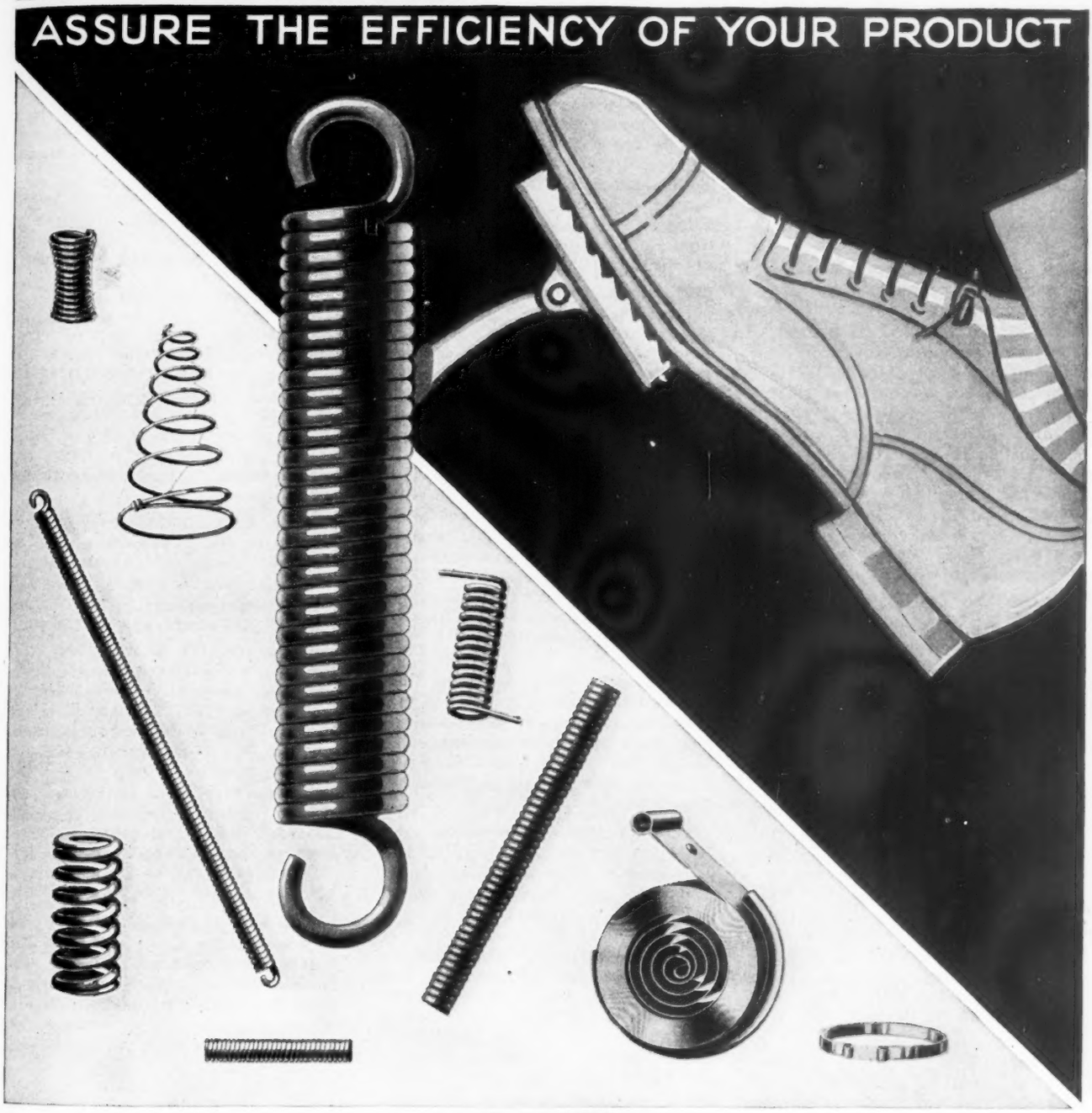


1831 — COMMEMORATING AMERICAN STEEL & WIRE COMPANY 100 YEARS OF PROGRESS IN WIRE MAKING — 1931

## AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

*Pacific Coast Distributors:* Columbia Steel Company, Russ Building, San Francisco

*Export Distributors:* United States Steel Products Company, New York

# Pig Iron

**Middle Western Market Easier —Basic Down 50 Cents—Improved Buying Expected Soon**

PIG IRON PRICES, PAGE 67

**Pittsburgh**—Demand for pig iron is slow and shipments are off slightly since early October. New business is holding at the recent quiet rate. Quotations have been weakened by dull demand and competition from outside furnaces, and the lower prices now are generally recognized. Basic iron, in a nominal market for several months, now is quotable at $15 to $15.50, valley, on the basis of relatively large sales, while bessemer and malleable usually are quoted $16.50, valley, a reduction of 50 cents from the level prevailing since January. No. 2 foundry also is lower, producers quoting a maximum of $16.50, valley.

**Boston**—A western Massachusetts heating equipment interest is feeling out the market for close to 500 tons, namely No. 2 plain, probably for first quarter. The local furnace is reported to have booked about 1000 tons, during the week. Some India iron is on the way; the price, $18.25 to $19.25, docks. The New England furnace range holds at $17 to $18.50. Small lots of Buffalo iron are reported to have been sold close to $15, furnace.

**New York**—Pig iron sales again are light, with inquiry promising little early improvement. Buffalo iron for delivery in this district is unchanged at $15 to $15.50, furnace, and eastern Pennsylvania iron at $15.50 to $16, furnace. Southern iron is nominally $16.50, delivered, New York docks.

The A. P. Smith Mfg. Co., Bloomfield, N. J., has placed 300 tons of No. 2 plain and No. 2 X iron for first quarter.

**Philadelphia**—Demand for pig iron is quiet. Eastern Pennsylvania iron is easy at $16 to $16.50, furnace, with $16 the usual figure. Foreign low phosphorus iron is being quoted around $18.50 to $19.50 c.i.f. A firm offer would likely develop concessions.

**Buffalo**—Slow but steady improvement is noted in pig iron. Some foundries have bought more liberally this month than at any time since May.

**Youngstown, O.**—A valley producer sold about 2100 tons of standard basic in competition with a Wheeling, W. Va., steel producer for delivery to a Butler, Pa., steelmaker at a delivered price of slightly higher than $15. Immediately afterward, another sale of basic, less than 100 tons, was made that netted the valley producer $16, furnace. On the basis of these sales, basic is quoted $15 to $15.50, valley furnace. Active outside furnace competition in No. 2 foundry has brought the price of this grade to a range of $16.25 to $16.50, valley. This grade is being bought in the Canton- Massillon district at around $16.50, delivered. Standard bessemer and malleable irons have been marked down to $16.50 to $17.00, valley.

**Cleveland**—At the beginning of October there was a slight flurry of buying for the month, following which business tapered off, the past week merely marking a continuation of the quiet situation. Similarly, buying for November requirements is expected to pick up in a few days. Some melters in western Ohio are asking for prices on limited lots. One merchant lake furnace interest booked 3000 tons in the week. The market continues easy. Cleveland furnaces have had to go outside this district to seek business with $15.50, base, furnace, figuring frequently in sales, and less reported. For local delivery the usual market is $17, base, furnace.

**Cincinnati**—Total sales of pig iron in this district amounted to less than 1000 tons in the week, contrasting with more than 3000 tons in the preceding week. Shipments reflect an irregular melt in jobbing foundries. Quotations are unchanged.

**Chicago**—Nearly all sales prospects for pig iron constitute individual cases in price arrangement. Special sales have been closed on the basis of $16.50, base, Chicago furnace, but $17 is regarded by merchant producers as the market. A sale of 100 tons of silvery iron brought out prices below the schedules. At test of $11, base, for southern iron resulted from a small order at that figure, or $17.01, delivered in the Chicago switching district. Sales remain at subnormal levels, although orders this month are nearly double those of September. Shipments also are far ahead of last month.

**St. Louis**—New orders continue in small volume, and prices are steady. Shipments are holding up fairly well. A moderate increase in specifications for finished castings is noted. Manufacturers of stove and heating apparatus report output in September the heaviest of any month this year, only 15 per cent less than in the month a year ago.

**Toronto, Ont.**—Sales for the week dropped to a new low, less than 300 tons. Melters show no interest in the market, except for immediate consumption. The daily melt is at 35 per cent of capacity. Few contracts have been closed for future delivery.

**Birmingham, Ala.**—Melters maintain their policy of buying pig iron only for immediate demands. Deliveries are prompt. Prices are steady.

## Ferroalloys Quiet; Better Inquiry for Special Grades

Ferroalloy Prices, Page 67

**Pittsburgh** — Shipments of ferroalloys remain light, influenced by the continued low level of steelmaking operations. Prices are unchanged. Ferromanganese is $89.79, delivered, and no action is expected to be taken on the price for 1932 contracts for several weeks. Spiegeleisen continues $30, furnace, for small lots.

**New York**—Ferromanganese is moving slowly at $85, duty paid, in car lots. Domestic spiegeleisen, 19 to 21 per cent, is $30, furnace, and foreign spiegeleisen, 26 to 28 per cent, $31.50, duty paid.

Better inquiry is noted for silicons and low carbon chromes. Fifty per cent ferrosilicon is quoted on contract basis at $83.50 a gross ton in carlots. Less than carlot tonnages are $88.50. Ferrochrome is held at 11.00c a pound for 60 to 70 per cent, with 4 to 6 per cent carbon, on contracts. Spot deliveries are quoted 11.50c a pound, with 11.75c asked for quantities of less than one ton. Ferrotungsten is $1.10 to $1.20 a pound contained, f.o.b. refinery.

**Chicago**—Following rather brisk requisitions for ferroalloys early this month, specifications have tapered. No business of consequence has been done for some time in spiegeleisen, which remains at $30, eastern furnace, for the 19 to 21 per cent metal.

## Fluospar Quoted Lower

Fluorspar Prices, Page 67

**Chicago**—Sales of fluorspar have been made at $12.50, Kentucky and Illinois mines, which represents a reduction of 50 cents under the more generally quoted market of $13.

# Raw Material Prices

## Pig Iron

**Per Gross Ton**

**FOUNDRY, No. 2**

| | |
|---|---|
| Chicago furnace | $17.00 |
| Pittsburgh, dist. fur. | 17.00 |
| Pittsburgh, delivered | 17.63 to 18.13 |
| Valley furnace | 16.25 to 16.50 |
| Cleveland fur., local del. | 17.00 |
| Philadelphia, delivered | 16.76 to 17.26 |
| Virginia furnace | 17.50 |
| Granite City, Ill., fur. | 17.50 |
| Buffalo, fur., local del. | 17.00 |
| Buff., all-rail, Boston | 19.91 to 20.41 |
| Buff., all-rail, Brooklyn | 19.90 to 20.40 |
| Buff., all-rail, Newark | 18.28 to 18.78 |
| Ala., Bir. fur., local del. | 12.00 |
| Alabama, del. Chicago | 17.01 |
| Alabama, del. St. Louis | 15.42 |
| Alabama, del. Cincinnati | 14.69 to 15.19 |
| Ala., Phila., dock del. | 16.00 to 16.25 |
| Ala., Balt., dock del. | 16.00 |
| Alabama, New York dock | 16.50 |
| Ala., Boston dock del. | 16.50 to 16.75 |
| Tenn., Bir. base, local del. | 13.00 |
| Tennessee, del. Cinn. | 14.69 to 15.19 |
| Montreal, delivered | 23.00 to 23.50 |
| Toronto, delivered | 22.10 |

**FOUNDRY, NO. 2X**

| | |
|---|---|
| Buffalo, fur., local del. | 17.50 |
| Buff., all-rail, Brooklyn | 20.90 to 21.40 |
| Buffalo, all-rail Newark | 18.78 to 19.28 |
| Buff., all-rail, Boston | 20.91 to 21.41 |
| Virginia furnace | 18.00 |
| Eastern, del. Phila | 17.26 to 17.76 |

**FOUNDRY, NO. 1X**

| | |
|---|---|
| Buffalo fur., local del. | 18.50 |
| Eastern, del. Phila. | 17.76 to 18.26 |

**MALLEABLE**

| | |
|---|---|
| Valley furnace | 16.50 to 17.00 |
| Cleveland fur., local del. | 17.00 |
| Pittsburgh dist. fur. | 17.00 |
| Pittsburgh, delivered | 17.63 to 18.13 |
| Chicago, furnace | 17.00 |
| Buffalo fur., local del. | 17.50 |
| Eastern Penna., delivered | 18.26 to 20.41 |
| Granite City, Ill., fur. | 17.50 |
| Montreal, delivered | 24.00 |
| Toronto, delivered | 22.60 |

**BASIC**

| | |
|---|---|
| Pittsburgh, district fur. | 15.50 to 16.00 |
| Pittsburgh, delivered | 16.13 to 17.13 |
| Eastetrn Penn., del. | 16.00 to 16.50 |
| Buffalo fur., local del. | 16.50 to 17.00 |
| Montreal, delivered | 23.50 |
| Valley, furnace | 15.00 to 15.50 |

**BESSEMER**

| | |
|---|---|
| Valley furnace | 16.50 to 17.00 |
| Pittsburgh, delivered | 17.63 to 18.13 |
| Pittsburgh, furnace | 17.00 |

**LOW PHOS.**

| | |
|---|---|
| Valley fur., standard | 27.00 |
| Philadelphia, standard | 23.76 to 26.79 |
| Copper-bear., E. Pa. fur. | 21.50 to 23.00 |

**GRAY FORGE**

| | |
|---|---|
| Valley furnace | 16.00 |
| Pittsburgh district fur. | 16.50 |
| Pittsburgh, delivered | 17.13 to 17.63 |

**CHARCOAL**

| | |
|---|---|
| Lake Superior, del. Chi. | 25.04 |

**SILVERY**

Jackson County, O., fur. in per cents: 6—$20; 7—$20.50; 8—$19.00 to $21.00; 9—$21.50; 10—$22; 11—$23; 12—$24; 13—$26.

**BESSEMER FERROSILICON**

Jackson County, O., fur. in per cents: 10—23; 11—$24; 12—$25; 13—$27; 14—$29; 15—$31; 16—$33.

## Coke

**Prices Per Net Ton**

**Beehive Ovens**

| | |
|---|---|
| Connellsville furnace | $2.40 to 2.50 |
| Connellsville foundry | 3.25 to 4.50 |
| New River foundry | 6.00 |
| Wise county foundry | 4.25 to 5.00 |
| Wise county furnace | 3.50 to 4.25 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del. | 8.70 to 9.10 |
| Chicago, ovens | 7.50 |
| New England, del. | 10.50 |
| St. Louis, del. | 8.50 |
| Birmingham, ovens | 5.00 |
| Indianapolis, del. | 8.25 |
| Ashland, Ky., ovens, Connell., basis | 5.50 |
| Portsmouth, O., ovens, Connell., basis | 5.50 |
| Buffalo, ovens | 8.00 to 8.50 |
| Detroit, ovens | 8.00 |
| Philadelphia, del. | 8.75 |

## Iron Ore

**LAKE SUPERIOR ORE**

**Gross ton, 51½%, Lower Lake Ports**

| | |
|---|---|
| Old range bessemer | $4.80 |
| Mesabi bessemer | 4.65 |
| Old range nonbessemer | 4.65 |
| Mesabi nonbessemer | 4.50 |
| High phosphorus | 4.40 |

**EASTERN LOCAL ORES**

**Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces**

| | |
|---|---|
| Foundry and basic, 56-63%, contract | 10.00 |
| Copper-free low phos. 58-65% | nom. |

**FOREIGN ORE**

**Cents per units, alongside docks Atlantic ports**

| | |
|---|---|
| Foreign manganiferous ore, 45-55% iron, 6-10% manganese | 10.00 |
| North African low phosphorus | 8.50 |
| Swedish basic, 65% | 9.00 |
| Swedish low phos. | 10.00 |
| Spanish, North African basic, 50 to 60% | 8.50 to 9.00 |
| Newfoundland fdy., 55% | 8.50 |
| Tungsten, spot and future short ton unit, duty paid | $11.25 to $11.80 |
| Chrome ore, 48% net ton c.i.f. | $21.50 to 22.00 |

## Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

| | |
|---|---|
| Caucasian, 52-55% (nom.) | 26 cents |
| South African, 52% | 24 to 26 cents |
| South African, 49-51% | 23 to 24 cents |
| South African, 44-47% | 22.50 cents |
| Indian, 48-50% | nom. |
| Brazilian, 46-48% (nom.) | nominal |

## Refractories

**FIRE CLAY BRICK**

**Per 1000 f.o.b. Works**

**First Quality**

| | |
|---|---|
| Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama | $40.00 |
| Missouri | 37.00 |

**Second Quality**

| | |
|---|---|
| Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland | 25.00 to 35.00 |
| Georgia, Alabama | 30.00 |

**SILICA BRICK**

| | |
|---|---|
| Pennsylvania | 40.00 |
| Joliet, Ill., East Chicago, Ind. | 49.00 |
| Birmingham, Ala. | 50.00 |

**MAGNESITE BRICK**

**Per Net Ton**

| | |
|---|---|
| 9 x 4½ x 2½ | $65.00 |

**MAGNESITE**

| | |
|---|---|
| Dead burned grain, net ton, Chester, Pa., or Baltimore bases | 40.00 |
| Domes, Chewelah, Wash., base | 22.00 |

**CHROME BRICK**

| | |
|---|---|
| Net ton, Chester, Pa., and Balt. base, 9 x 4½ x 2½ | 45.00 |

## Semifinished Steel

**Prices Per Gross Ton**

**BILLETS AND BLOOMS**

**4 x 4-inch base**

| | |
|---|---|
| Pittsburgh, open-hearth | $29.00 |
| Pittsburgh, bessemer | 29.00 |
| Youngstown | 29.00 |
| Cleveland | 29.00 |
| Philadelphia | 34.30 |
| Chicago | 30.00 |
| Forging, Chicago | 35.00 to 36.00 |
| Forging, Pittsburgh | 35.00 |
| Forging, Philadelphia | 39.30 |

**SHEET BARS**

| | |
|---|---|
| Pittsburgh | 29.00 |
| Youngstown | 29.00 |
| Cleveland | 29.00 |
| Chicago | 30.00 |

**SLABS**

| | |
|---|---|
| Pittsburgh | 29.00 |
| Youngstown | 29.00 |
| Cleveland | 29.00 |

**WIRE RODS**

| | |
|---|---|
| Pittsburgh, Cleveland | 35.00 |
| Chicago | 36.00 |

**SKELP**

| | |
|---|---|
| All grades, Pittsburgh | 1.60c |

## Ferroalloys

**(In dollars, except Ferrochrome)**

| | |
|---|---|
| *Ferromanganese, 78-82%, tidewater, duty paid | $85.00 |
| *Ferromanganese, del. Pittsburgh | 89.79 |
| Spiegeleisen, 19-20%, domestic fur. spot† | 30.00 |
| Ferrosilicon, 50 per cent, freight all., c. l. | 83.50 |
| Do, less carload | 88.50 |
| Do, 75 per cent | 130.00 to 150.00 |
| Silicomang., 2½% carb. | 105.00 |
| 2% carbon | 110.00 |
| 1% carbon | 115.00 |
| (Spot prices, $5 a ton higher.) | |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con. del. | 11.00 |
| Do, for spot delivery | 11.50 |
| Ferrotungsten, stand., lb. cont. | 1.10 to 1.20 |
| Ferrovanadium, 30-40 per cent, per lb., contained, on analysis | 3.15 to 3.40 |
| Ferro-carbon-titanium carload producers' plants, net ton | 150.00 |
| Do, one-ton to c. l. | 170.00 |
| Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent) | 91.00 |
| Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24% | 122.50 |
| Ferromolybdenum, stand. 50-60 per cent, per lb. | $1.00 |
| Cal. Molybdate, lb. cont. | .85 |

†Carloads. Differentials apply to quant. *To users of carloads to 500 tons annually. Differentials to large users.

## Fluorspar

**85 and 5 per cent grade**

| | |
|---|---|
| Washed gravel Kentucky and Illinois mines, per net ton | $12.50 to 13.00 |
| Washed gravel, import duty paid east, tide, gross ton | 18.50 |

## Mill Products

**Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 7.25c, Conn., for copper**

| | |
|---|---|
| **Sheets** | |
| Yellow brass (high) | 13.00 |
| Copper, hot rolled | 16.12½ |
| Lead, full sheets (cut ½c more) | 8.25 |
| Zinc sheet (100-lb. base) | 9.00 |
| **Tubes and Pipes** | |
| Seamless yellow brass (high) | 16.25 |
| Seamless copper | 15.62½ |
| **Rods** | |
| Yellow brass (high, full turnings) | 11.25 |
| Naval brass | 12.37½ |
| **Anodes** | |
| Copper, untrimmed | 12.62½ |
| **Wire** | |
| Yellow brass (high) | 13.50 |

## Old Metals

**Dealers' buying prices, cents lb. No. 1 Composition Red Brass**

| | |
|---|---|
| New York | 4.00 to 4.25 |
| Chicago | 3.50 to 3.75 |
| Cleveland | 4.00 to 4.50 |
| St. Louis | 4.00 |
| **Heavy Yellow Brass** | |
| New York | 2.50 to 2.75 |
| **Heavy Copper and Wire** | |
| New York | 5.00 to 5.25 |
| Boston | 4.75 to 5.00 |
| Chicago | 4.00 to 4.50 |
| Cleveland | 4.00 to 4.50 |
| St. Louis | 4.25 to 4.50 |
| **Composition Brass Borings** | |
| New York | 3.75 to 4.00 |
| **Yellow Brass Tubing** | |
| Cleveland | 2.50 to 2.75 |
| **Light Copper** | |
| New York | 4.00 to 4.25 |
| Chicago | 3.50 to 3.75 |
| Cleveland | 3.75 to 4.00 |
| St. Louis | 4.00 |
| **Light Brass** | |
| Boston | 1.75 to 2.50 |
| Chicago | 2.00 to 2.25 |
| Cleveland | 1.75 to 2.00 |
| St. Louis | 2.25 |
| **Zinc** | |
| New York | 1.00 to 1.25 |
| Cleveland | 1.00 to 1.25 |
| St. Louis | 1.50 |
| **Aluminum** | |
| Clippings, soft, Cleveland | 12.00 to 13.00 |
| Clippings, hard, Cleveland | 8.00 to 9.00 |
| Borings, Cleveland | 3.00 to 3.50 |
| Mixed cast, Cleveland | 3.75 to 4.00 |
| Mixed cast, Boston | 3.25 to 3.50 |
| Mixed cast, St. Louis | 4.00 |

## Secondary Metals

| | |
|---|---|
| Remelt aluminum No. 12' | 8.50 to 9.50 |
| Brass ingots, 85-5-5-5 | 7.37½ |

# Metals

**Strength in Copper Features the Market—Lead and Zinc Decline as Tin Holds Steady**

**New York**—A stronger tone in copper features the metals. Tin demand is light but prices are fairly steady. Lead prices are off $5 a ton, New York basis, and $6, East St. Louis. Antimony is slightly stronger but slow.

**Copper**—Improved sentiment in copper is attributed to arrival of foreign copper producers in this country to participate in meetings with American interests with regard to curtailment of production. Expressions of willingness on the part of Belgian producers to curtail have a buoyant effect.

Heaviest export demand in a number of weeks also is serving as an aid to sentiment. Export business this week exceeded 11,000 tons. Custom smelters are withdrawing from the market and an advance in copper seems likely.

**Tin**—Prices have been moving in a narrower range this week and are steadier. New business is light. English stocks at the close of last week totaled 29,508 tons, off 217 tons from the preceding week.

**Lead**—The further reduction in lead Tuesday has resulted in only moderate stimulation of business. A western seller is disposing of metal only derived from daily ore intake pending improvement in the market.

**Zinc**—Demand for zinc is dull and prices show further easiness. Many zinc sellers remain out of the market. New business is light.

**Antimony**—Futures are up slightly due to the stronger market in China. Spot also is firmer. Demand is dull.

**Silver**—Prices are firmer due to improved demand from the Far East.

**Aluminum**—Sales are light and quotations remain unchanged.

## Distillate Supply Short; Sulphate Prices Easy

**New York**—The supply of some distillates approaches a shortage and distributors are not offering large additional quantities. Most of the current production of benzol and toluol is going directly into consumption. Xylol and solvent naphtha also are in short supply. Some contracting is being done in naphthalene, but covering is slower than usual. Phenol is moving steadily and in fair volume. Sulphate of ammonia is dull, with prices easy.

## Coke By-Products

| | Spot |
|---|---|
| Per Gallon, Producers' Plants, Tank Lots | |
| Pure benzol | $0.20 |
| 90 per cent benzol | 0.20 |
| Toluol | 0.30 |
| Solvent naphtha | 0.26 |
| Commercial xylol | 0.26 |
| Per Pound at Producers' Plants in 250-Pound Drums | |
| Phenol | 0.16 to 0.17 |
| Per Pound at Producers' Plants in | |
| Naphthalene flakes | 3.75 to 4.75 |
| Naphthalene balls | 4.75 to 5.75 |
| Per 100 Pounds Atlantic Seaboard | |
| Sulphate of ammonia | $1.30 |

## Quicksilver Quiet, Easy

**New York**—Quicksilver demand is quiet and further decline is shown in prices. The metal now is quotable at $74 to $75 a virgin flask of 75 pounds for small lots.

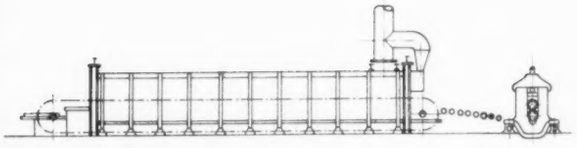
## Short Week an Expedient

New York—An inquiry by the Merchants' Association of New York among 14 large, representative manufacturing plants discloses that only two are considering the 5-day work week as a solution of their future industrial problems. The remaining 12 consider the 5-day week a temporary expedient.

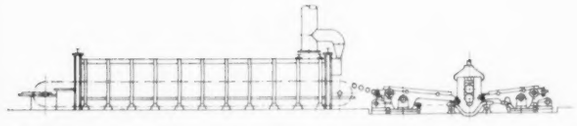
## Prices of the Week, Cents a Pound

| | Copper | | | Straits Tin New York | | Lead | Lead East | Zinc | Aluminum | Spot | Ingot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Electro delivered | Lake delivered | Casting refinery | Spot | Futures | N. Y. | St. L. | St. L. | 98-99% | Antimony | Nickel |
| October 17 | 7.00 | 7.37½ | 6.87½ | 22.87½ | 23.37½ | 4.00 | 3.82½ | 3.35 | 22.90 | 6.55 | 35.00 |
| October 19 | 7.00 | 7.37½ | 6.87½ | 22.75 | 23.20 | 4.00 | 3.82½ | 3.32½ | 22.90 | 6.55 | 35.00 |
| October 20 | 7.00 | 7.37½ | 6.87½ | 22.87½ | 23.35 | 3.75 | 3.52½ | 3.30 | 22.90 | 6.55 | 35.00 |
| October 21 | 7.00 | 7.37½ | 6.87½ | 23.00 | 23.45 | 3.75 | 3.52½ | 3.30 | 22.90 | 6.55 | 35.00 |
| October 22 | 7.00 | 7.37½ | 6.87½ | 22.87½ | 23.40 | 3.75 | 3.52½ | 3.30 | 22.90 | 6.55 | 35.00 |
| October 23 | 7.00 | 7.37½ | 6.87½ | 22.75 | 23.25 | 3.75 | 3.52½ | 3.30 | 22.90 | 6.55 | 35.00 |

# AS FAST AS THE MILL WILL TAKE IT



ROUGHING UNIT—Continuous Pair Heating Furnace, Self Discharging.



FINISHING UNIT—Continuous Pack Heating Furnace, Self Discharging, Mechanical Feeder and Catcher.

Speed, with the "COMBINATION SYSTEM," is "as fast as the mill will take it." When using our equipment, you are assured of greatest output at lowest cost. Only our experience, gained through many installations, can guarantee such results.

The continuous heating furnaces and mechanical equipment for two-high mills included in this System are covered by one or more of the following patents: Nos. 1702739, 1730739, 1746488, 1750534, 1760762, 1767574, 1779964. Licenses to operate under all of these patents and other patents pending can be furnished only by The Wean Engineering Company, Inc.

*The* "COMBINATION SYSTEM" TRADE MARK

*for* SHEET AND TIN PLATE PRODUCERS

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## THE WEAN ENGINEERING CO., Inc. • Warren, Ohio

FLINN & DREFFEIN CO. • *Associated Companies* • THE McKAY MACHINE CO.

# Pacific Coast

**California Orders Largest for Month—State and Municipal Projects Give Most Tonnage—Northwest Has Much Prospective Work, Slow to Close—Scrap Is at Record Low Level**

**San Francisco**—(*By Air Mail*)—Reinforcing bar, plate and cast iron pipe awards are the heaviest in over a month. Structural awards also involved a fair sized total. New business for the week was confined mostly to state and municipal work. The largest letting called for 1500 tons of structural shapes for the Third street bridge, San Francisco, booked by the Pacific Coast Engineering Co.

### Bars, Plates and Shapes

Over 1800 tons of concrete bars were placed. Among the larger lots were 600 tons for two gymnasiums for the University of California, Los Angeles, and 300 tons for the Third street bridge, San Francisco, taken by the Pacific Coast Steel Corp. An unnamed interest booked 250 tons for the Pomona-Progress Bulletin building, Pomona, Calif. No award has yet been made on 400 tons for the Sunnyvale airship dock. Bids are being taken on 310 tons for a school for the blind in Berkeley, Calif. Los Angeles warehouse quotations hold at 2.50c, base, on carload lots. Prices in the San Francisco district are firm at 2.60c, base. Consumers of mild steel bars continue to buy in small lots only. On this class of material 2.05c, c.i.f., is general.

Plate fabricators are interested in the 114-inch Bear Creek siphon for the Hetch Hetchy project, San Francisco, bids on which open this week. Close to 800 tons of ⅜ to ¾-inch plates will be required in addition to over 50 tons of structurals. Snead & Co. secured 250 tons for book shelves for the University of Southern California, Los Angeles. No award has yet been made on 225 tons of 24 and 36-inch welded steel pipe for the Reynolds Irrigation district, Boise, Idaho. No change has occurred in prices and 1.85c to 1.95c, c.i.f., is the range.

The Pacific Coast Steel Corp. booked 626 tons of sheet steel piling for the San Gabriel river outlet project for Los Angeles county. McClintic-Marshall Corp. booked 200 tons of shapes for the Pasadena-Post building, Pasadena, Calif. Bids are to be called for shortly for close to 6000 tons for the Los Angeles Times building, Los Angeles, and also on 600 tons for Pier sheds No. 144-5-6, Los Angeles. Six Companies Inc. is asking for bids on 600 tons for storage bins at Boulder City, Nev. An award is expected to be made within a few days on 420 tons for Pier Shed No. 23, San Francisco, on which the Herrick Iron Works is low bidder. Plain shapes continue to range between 2.05c and 2.15c, c.i.f.

### Other Finished Material

The largest cast iron pipe award involved 1361 tons of 4 to 8-inch pipe for the East Bay municipal utility district, Oakland. The National Cast Iron Pipe Co. secured 1077 tons and the Pacific States Cast Iron Pipe Co. took 284 tons. Anaheim, Calif., awarded 139 tons of 4 to 8-inch pipe to the American Cast Iron Pipe Co. Bids have been opened on 215 tons for Arcadia, Calif., and on 159 tons for Mesa, Ariz. No pipe line inquiries are current. Movement of standard steel pipe is limited to small lots, seldom exceeding a carload.

## Coast Pig Iron Prices

| | |
|---|---|
| Utah basic | $22.00 to 24.00 |
| Utah foundry | 22.00 to 24.00 |
| *German | 24.25 |
| *Indian | 22.00 to 24.00 |

*C.i.f. duty paid.

## Northwest Trade Dull

**Seattle**—Conditions in the steel market of the Pacific Northwest are unchanged. This week's awards were in excess of 1000 tons but business as a whole is weak, and below last year's level. No outstanding projects are up for immediate action. Public works continue to dominate, industrial activity being lacking. Isaacson Iron Works, Seattle, has begun delivery of 2700 tons of structurals for the Seattle federal building. Much interest attaches to the call for bids for the Portland federal building, opening Nov. 30.

International Utilities Corp. plans to pipe natural gas from the Sunburst fields, Montana, and the Caspar fields, Wyoming, through Oregon and Washington to British Columbia. From Weiser, Idaho, to Portland, a 20-inch line is projected, the Oregon unit to cost $8,000,000. The entire job will cost $30,000,000, a bond issue in this amount having been underwritten in New York. Application for franchises in Oregon and Washington have been filed and it is hoped to begin work this winter.

### Pig Iron and Coke

The foundry situation has not improved, operations being estimated at 20 per cent. Some plants are working only one or two days a week. Turnover of pig iron and coke is correspondingly small. Columbia No. 1 is quoted at $21.50 and Burn at $22.50 but sales are nominal. A few cars of coke are being absorbed, Tyneside selling at $13 and Victoria at $13.50. There is practically no demand for domestic coke.

### Bars, Plates and Shapes

Both merchant and reinforcing bars are in poor demand and no awards over 100 tons were reported this week. Pending projects call for small lots, about 200 tons being involved in a King county bridge, a grade separation project in Seattle and five state bridges.

About 600 tons of plates were involved in two awards this week. Pittsburgh-Des Moines Steel Co. booked tanks and pipe line, 150 tons, for a terminal storage plant at Tacoma for True's Oil Co. The same firm was low bidder for building two water tanks and standpipes for Seattle but the contract went to Western Engineering Corp., Seattle, as specifications called for local fabrication. This job involves 440 tons of plates and 100 tons of shapes.

Following the same policy of fostering local labor, Seattle city council awarded to the Pacific Coast Steel Corp., Seattle, the contract for 50 tons of shapes and angles for two light towers, although A. M. Castle & Co., Seattle, offered a bid $200 less. Pittsburgh-Des Moines Steel Co. has the contract to furnish 65 tons of structurals for the Agness bridge, Curry county, Oregon, and the Pacific Iron Works, Portland, will fabricate 175 tons for a federal bridge in Umatilla county, Oregon, general contract to Union Bridge Co., Portland. These jobs were reported last week to unnamed interests.

### Old Materials Lag

Local steel mills are out of the market and decline to make offers. Foundries are buying only occasionally and while dealers are asking $10 cars, plant, recent sales are said to have been at $8.50 and less for best No. 1, cupola size. Brake shoes are quoted at $4.50 and auto scrap at $6.50 net ton. A dealer in Seattle who bid $5, net ton, f.o.b. Seattle, for 100 tons No. 1 cast iron, cupola size, was taken by surprise when an Alaskan shipper accepted the offer.

# Steel, Wrought and Cast Iron Pipe, and Tubing

## Welded Iron, Steel Pipe

**Base Price $200 Ton**

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

**BUTT WELD**

| | Steel | | Iron | |
|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. |
| ⅛ | 58 | 44½ | 23 | 5 |
| ¼ | 62 | 50½ | 28 | 11 |
| ¾ | 64 | 52½ | 31 | 15 |
| 1—1¼ | | | 31 | 15 |
| 1½—2 | | | 35 | 18 |

**LAP WELD**

| | | | |
|---|---|---|---|
| 2 | 57 | 45½ | 23 | 9 |
| 2½—6 | 61 | 49½ | 28 | 13 |
| 7—8 | 58 | 45½ | 30 | 17 |
| 9—10 | 56 | 43½ | 29 | 16 |
| 11—12 | 55 | 42½ | 26 | 11 |

**BUTT WELD**

*Extra strong, plain ends*

| | | | |
|---|---|---|---|
| ⅛ | 55 | 44½ | ¼ & ⅜ | +13 | +48 |
| ¼ | 60 | 49½ | ½ | 23 | 7 |
| 1—1½ | 62 | 51½ | ¾ | 28 | 12 |
| 2—3 | 63 | 52½ | 1—2 | 34 | 18 |

**LAP WELD**

*Extra strong, plain ends*

| | | | | |
|---|---|---|---|---|
| 2 | 55 | 44½ | 2 | 29 | 13 |
| 2½—4 | 59 | 48½ | 2½—4 | 34 | 20 |
| 4½—6 | 58 | 47½ | 4½—6 | 33 | 19 |
| 7—8 | 54 | 41½ | 7—8 | 31 | 17 |
| 9—10 | 47 | 34½ | 9—12 | 21 | 8 |
| 11—12 | 46 | 33½ | | | |

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

**BOILER TUBES**

**Carload Discounts, f. o. b. Pittsburgh**

| Lap Welded Steel | | Charcoal Iron | |
|---|---|---|---|
| 2—2¼ | 38 | 1¾ | 8 |
| 2½—2¾ | 46 | 2—2¼ | 13 |
| 3 | 52 | 2½—2¾ | 16 |
| 3¼—3¾ | 54 | 3 | 17 |
| 4 | 57 | 3¾—3½ | 18 |
| 4½—6 | 46 | 4 | 20 |
| 1½ | 1 | 4½ | 21 |

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

**STANDARD COMMERCIAL SEAMLESS BOILER TUBES**

**COLD DRAWN**

| | | | |
|---|---|---|---|
| 1 inch | 61 | 3 | 46 |
| 1¼—1½ | 53 | 3¼—3½ | 48 |
| 1¾ | 37 | 4 | 51 |
| 2—2¼ | 32 | 4½, 5, 6 | 40 |
| 2½—2¾ | 40 | | |

**HOT ROLLED**

| | | | |
|---|---|---|---|
| 2—2¼ | 38 | 3¼—3½ | 54 |
| 2½—2¾ | 46 | 4 | 57 |
| 3 | 52 | 4½, 5, 6 | 46 |

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload. base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Tubing

**Cold drawn; f.o.b. mill discounts**

Random lengths over 5 ft. .....55%
Selected lengths, 1—18 ft. .....53%

## Cast Iron Water Pipe

**Class B Pipe—Per Net Ton**

Six-inch and over, Bir. ....$33.00 to 35.00
Four-inch, Birmingham .... 37.00 to 39.00
Four-inch, Chicago ..... 43.00 to 46.00
Six to 24-inch, Chicago..... 40.00 to 43.00
Six-inch and over, N. Y..... 30.00 to 32.00
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

# Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

**STEEL BARS**

| | |
|---|---|
| Baltimore | 3.00c |
| Boston | 3.265c |
| Buffalo | 3.00c |
| Chattanooga.. | 3.00c |
| Chicago | 2.75c |
| Cincinnati | 3.00c |
| Cleveland | 2.75c |
| Detroit | 2.85c |
| Houston | 3.00c |
| Los Ang. | 3.40c |
| New York‡(d) | 3.10c |
| Philadelphia.. | 2.60c |
| Pittsburgh | 2.60c |
| Portland | 3.15c |
| San Fran. | 2.40c |
| Seattle | 3.00c |
| St. Louis | 3.00c |
| St. Paul | 3.00c |
| Tulsa | 3.25c |

**IRON BARS**

| | |
|---|---|
| Baltimore | 3.25c |
| Boston | 3.265c |
| Buffalo | 3.15c |
| Chattanooga.. | 3.00c |
| Chicago | 2.75c |
| Cincinnati | 3.00c |
| Detroit | 2.85c |
| New York‡(d) | 3.10c |
| Philadelphia.. | 2.60c |
| St. Louis | 3.00c |
| Tulsa | 3.25c |

**REINFORC. BARS**

| | |
|---|---|
| Baltimore | 2.50c-3.31c |
| Boston | 3.10c-3.25c |
| Buffalo | 2.95c |
| Chattanooga.. | 3.00c |
| Cincinnati | 3.00c |
| Cleveland | 2.10-2.25c |
| Detroit | 2.85c |
| Houston | 3.00c |
| Los Ang. cl... | 2.50c |
| Los Ang. lcl.. | 2.80c |
| New York | 2.65c-3.10c |
| Phila. | 2.40c-3.00c |
| Pittsburgh | 2.60c |
| San Fran. cl. | 2.60c |
| San Fran. lcl. | 2.90c |
| Seattle | 3.00c |
| St. Louis | 3.15c |
| Tulsa | 3.25c |
| Young. | 2.30c-2.60c |

**SHAPES**

| | |
|---|---|
| Baltimore | 3.00c |
| Boston | 3.35c |
| Buffalo | 3.25c |
| Chattanooga.. | 3.20c |
| Chicago | 3.00c |
| Cincinnati | 3.25c |
| Cleveland | 2.95c |
| Detroit | 3.10c |
| Houston | 3.25c |
| Los Ang. | 3.40c |
| New York(d) | 3.10c |
| Philadelphia.. | 2.50c |
| Pittsburgh | 2.85c |
| Portland | 3.15c |
| San Fran. | 2.40c |
| Seattle | 3.00c |
| St. Louis | 3.25c |
| St. Paul | 3.10c |
| Tulsa | 3.50c |

**PLATES**

| | |
|---|---|
| Baltimore | 3.00c |
| Boston | 3.365c |
| Buffalo | 3.25c |
| Chattanooga.. | 3.20c |
| Chicago | 3.00c |
| Cincinnati | 3.25c |
| Cleveland, ¼-in. and thicker | 2.95c |
| Clev., 3/16-in. | 3.20c |
| Detroit | 3.10c |
| Det., 3/16-in. | 3.10c |
| Houston | 3.00c |
| Los Angeles.. | 3.40c |
| New York(d) | 3.30c |
| Philadelphia.. | 2.50c |
| Phila. floor.... | 5.10c |
| Pittsburgh | 2.85c |
| Portland | 3.15c |
| San Fran. | 2.40c |
| Seattle | 3.00c |
| St. Louis | 3.25c |
| St. Paul | 3.10c |
| Tulsa | 3.50c |

**NO. 10 BLUE**

| | |
|---|---|
| Baltimore | 3.25c |
| Boston | 3.915c |
| Buffalo | 3.50c |
| Chattanooga.. | 3.50c |
| Chicago | 3.20c |
| Cincinnati | 3.30c |
| Cleveland | 3.00c |
| Detroit | 3.35c |
| Houston | 3.90c |
| Los Ang. | 3.95c |
| N. Y. (d) | 3.00c-3.40c |
| Portland | 4.00c |
| Phila.*† (e).. | 3.05c |
| Pitts.** | 2.60c to 2.85c |
| San Fran. | 3.65c |
| Seattle | 3.75c |
| St. Louis | 3.45c |
| St. Paul | 3.40c |
| Tulsa | 3.70c |

**NO. 24 BLACK**

| | |
|---|---|
| Balt.*† | 3.50c |
| Boston | 4.70c |
| Buffalo | 3.70c |
| Chattanooga.. | 3.65c |
| Chicago | 3.55c |
| Cincinnati | 3.75c |
| Cleveland | 3.60c |
| Detroit | 3.50c |
| Los Ang. | 4.70c |
| New York | 3.50c-3.65c |
| Phila.*†(e) | 3.55c |
| Pitts.** | 3.40c |
| Portland | 4.50c |
| San Fran. | 4.15c |
| Seattle | 4.25c |
| St. Louis | 3.80c |
| St. Paul | 3.545c |
| Tulsa | 4.75c |

**NO. 24 GAL. SHEETS**

| | |
|---|---|
| Balt.*† | 4.00c |
| Boston | 5.45c |
| Buffalo | 4.10c |
| Chattanooga.. | 3.95c |
| Chicago | 4.10c |
| Cincinnati | 4.25c |
| Cleveland | 4.00c |
| Detroit | 4.00c |
| Houston | 5.40c |
| Los. Ang. | 5.10c |
| New York | 4.00c-4.10c |
| Phila.*† (e) | 4.00c |
| Pitts.** | 4.00c |
| Portland | 5.00c |
| San Fran. | 4.65c |
| Seattle | 4.75c |
| St. Louis | 4.35c |
| St. Paul | 4.23c |
| Tulsa | 5.10c |

**BANDS**

| | |
|---|---|
| Baltimore | 3.50c |
| Boston | 3.75c-4.25c |
| Buffalo | 3.35c |
| Chattanooga.. | 3.20c |
| Chicago | 2.95c |
| Cincinnati | 3.20c |
| Cleveland | 3.00c |
| Det. 3/16-in. & lighter | 3.15c |
| Houston | 3.65c |
| Los Ang. | 4.30c |
| New York(d) | 3.40c |
| Philadelphia.. | 2.90c |
| Pittsburgh | 2.95c |
| Portland | 3.50c |
| San Fran. | 3.75c |
| Seattle | 3.50c |
| St. Paul | 3.75c |
| Tulsa | 3.45c |

**HOOPS**

| | |
|---|---|
| Baltimore | 3.50c |
| Boston | 4.90c-5.40c |
| Buffalo | 3.90c |
| Chicago | 3.50c |
| Cincinnati | 3.75c |
| Cleveland | 3.55c |
| Det. No. 14 & lighter | 3.65c |
| New York | 3.75c |
| Philadelphia.. | 3.15c |
| Pittsburgh | 3.60c |
| Seattle | 4.90c |
| St. Paul | 3.75c |

**COLD FIN. STEEL**

**Rounds & Hexagons**

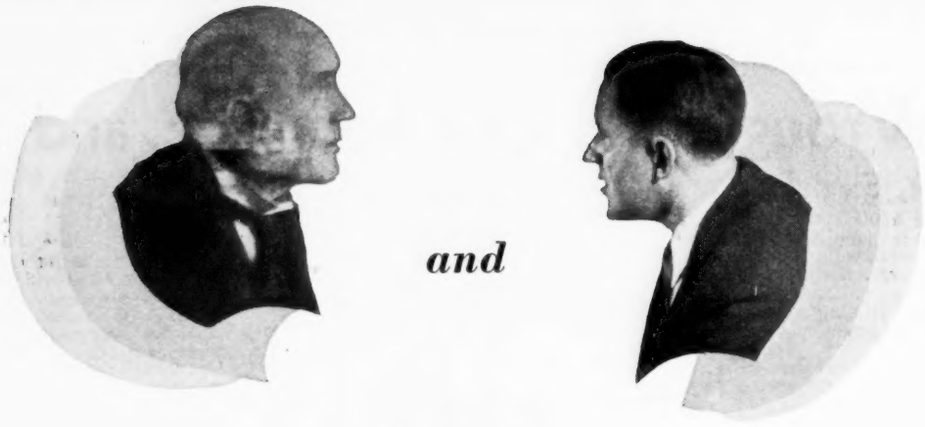
| | |
|---|---|
| Baltimore (c) | 3.30c |
| Boston | 3.50c |
| Buffalo | 3.15c |
| Chattanooga* | 3.75c |
| Chicago | 3.10c |
| Cincinnati | 3.50c |
| Cleveland | 3.10c |
| Detroit | 3.40c |
| Los Ang. (a) | 4.50c |
| New York | 3.40c |
| Philadelphia* | 3.40c |
| Pittsburgh | 3.10c |
| Portland (a) | 4.50c |
| San Fran.(a) | 4.25c |
| Seattle (a) | 4.50c |
| St. Paul (a).. | 3.85c |
| St. Louis | 3.35c |
| Tulsa | 4.65c |

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

**COLD ROLL. STRIP**

| | |
|---|---|
| Boston 0.100 in., 500 lb. lots | 5.30c |
| Buffalo | 5.65c |
| Chicago (soft) (b).. | 5.65c |
| Cincinnati | 5.80c |
| Clev. (b) | 5.55c |
| Detroit | 5.40c |
| Phila. (c) | 4.55c |
| New York | 4.55c |

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.



*and*

*discuss*

# SEPARATELY EXCITED ARC WELDERS

"What's all this excitation of the generator that these welder salesmen talk about? They've sorta got me excited."

"—and probably confused. The welder generator field should be constantly excited. In a Lincoln 'Stable-Arc' welder there is a separate exciter to do this job. It does it so well that there is a constant excitation in the welder under all conditions, even to a short circuit."

"What of it? I'm no electrician."

"No, but you drive an automobile. Did you ever line up with two or three cars at a red light and then step out in front, ahead of 'em all — quick pick up — acceleration, and all that?"

"Yes, but what of that?"

"Well, that's what you get in a separately excited welder with laminated magnetic circuit. A combination belonging exclusively to

# LINCOLN

**THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO**

***Largest Manufacturers of Arc Welding Equipment in the World***

W-189

# Machinery

ALTHOUGH no general buying activity has developed, there is a feeling among machine tool builders that a serious credit crisis recently was averted by the action of President Hoover. Relief is apparent in renewed activity in engineering and in marketing efforts. Persistent rumors of new automobiles which will demand wide changes in production facilities sustain hopes for substantial orders from that source before the year is out. Those companies which until recently have been engaged in the production of machinery for Russia view with alarm reports of the placing of an increasing amount of Russian business in Germany.

**New York**—With the closing on several lists which have recently added some interest to the market, machine tool buying and inquiry again has slumped. Unless unexpected business develops, the present month will close with most dealers and builders showing little if any increase over the previous month. There are some exceptions, particularly those plants sharing in the recent orders released by Lycoming Mfg. Co. A few shops also are engaged actively on navy yard equipment and on machinery for the 207th street subway shop.

Inquiry is light, indicating limited buying during the next few weeks. Business which can be classed as active generally is spotty, and it is being unearthed in most cases by salesmen diligently engaged in combing all manufacturing industries. It requires intensive selling and engineering effort to impress prospective buyers, on account of their strong tendency to await future developments. Some equipment is being shifted from eastern navy yards, Brooklyn having recently received several tools from Boston. Connecticut ball bearing plants, taken collectively, are not operating much above 40 per cent of capacity.

Russia apparently is out of the market for the time being at least. It is reported that Russian interests recently purchased in Germany several hundred thousand dollars worth of equipment for an automobile plant.

**Worcester, Mass.**—Machinery activity in this district shows no signs of improvement. Lack of new Russian business now is being felt keenly in Worcester shops wherein much Russian machinery has been in process up until lately. The recent flurry of equipment buying by automobile companies has failed to give the market any sustained tone.

The principal outstanding business is included in government schedules calling for lathes for Newport navy yard. New England machinery builders fared poorly in the recent award of 17 lathes for Brooklyn navy yard. At this time they are making a strong bid for the Newport business. Otherwise, the demand for lathes is negligible.

**Pittsburgh**—Machine tool sales so far this month are slightly larger than during the comparable September period when business touched the lowest level of the year. The improvement has been small, however, and for some interests activity shows practically no change.

Lack of increase in inquiry points to no material expansion in business in the early future since there is only a moderate amount of pending work. Orders are confined largely to single tools, with no outstanding lists before the trade.

**Cleveland**—On account of the diversified industries in this territory, hard working salesmen find it possible to dig up small orders here and there. Large orders fail to materialize at any point just at this time, although a number of companies feel certain that some more substantial business is due to come out of the automobile industry before long, as new models go into production.

Manufacturers of screw machine products report improvement in their business. Machine tool builders are inclined to look upon this as a favorable sign, this being a recognized indicator of probable equipment market trend.

Executives of Cleveland machine tool building companies returned from the Chicago meeting of the National Machine Tool Builders' association with keen realization of the necessity for prompt action toward employment stabilization.

**Chicago**—Machine tool sales of the last ten days have made no upturn, although special equipment orders have gained. Farm equipment and tractor works are not expected to make purchases of consequence this year, although several will start limited production next month and in December. Rock Island railroad has purchased some special equipment, including a grinder and track welding tools. Other railroads have nothing ahead for at least three months.

Nevertheless, some cheer is noted as the result of the interstate commerce commission's decision permitting applications for higher rates on certain commodities. It is felt that later added revenue from higher rates on some shipments will aid the western machine tool market.

It is understood that Nash Motors Co. may be in the market for some equipment for its Kenosha, Wis., plant, which it is expanding for accommodation of automobile manufacturing departments formerly at Milwaukee. Less disposition is being shown on the part of buyers to bargain for prices.

## Machine Tool Dealers Hold Annual Meeting in Chicago

Relation of the machine tool building and selling to important current business and industrial problems was outlined by Dr. Julius Klein, assistant secretary of commerce, at a dinner meeting of the Associated Machine Tool Dealers at their semiannual meeting in Chicago, Oct. 14-16. At this fellowship dinner the dealers were hosts to the National Machine Tool Builders' association, whose meeting in Chicago immediately preceded that of the dealers.

Market and sales analysis, time payment financing of equipment purchases, and other pertinent topics constituted an important part of the program. The main feature was a display of maps by W. H. Rastall, chief of the industrial machinery division, department of commerce. Marketing opportunities throughout the country for numerous general products and machines were revealed clearly by these maps, concentrated buying power in certain sections being emphasized particularly.

Officers elected for the coming year were: President, William K. Stamets, William K. Stamets, Pittsburgh; vice president, Herbert E. Oatis, National Supply Co., Toledo, O.; secretary, Harry Barney, Barney Machinery Co., Pittsburgh; directors, H. A. Smith, H. A. Smith Machinery Co., Syracuse, N. Y.; L. H. Swind, Swind Machinery Co., Philadelphia, and John Sauer Jr., Peninsular Machinery Co., Detroit.

## Will Buy for Tunnel

Baltimore — Approximately 10,000 tons of cast iron segments will be required for development work here in connection with the Pennsylvania railroad's electrification program.

# Europe

**British Outlook More Encouraging—Markets in France, Belgium and Germany Depressed**

**London** — (*By Radio*)— Business in the British iron and steel markets is disturbed by the coming elections, but there are signs of broadening demand. Steelmakers are offering rebates to tin plate manufacturers who refuse to purchase Continental material.

Tin plate and galvanized sheet prices are easy. Exports of galvanized sheets are improving. Orders for small steel bars are more plentiful and prices are firmer. Heavy steel continues dull. The market for scrap is reviving.

Sales of British hematite are larger, with moderate exports. The Cargo Fleet Corp. has blown in an additional furnace.

STEEL's correspondent at Paris reports business depressed, and exports shrinking. Foreign competition is noted in the domestic market. In Belgium the outlook is unpromising, and the current report from Berlin states German export trade is dull. Some orders are being received for sheet bars and hoops.

## British Buyers Insist on Payment in Sterling

**Birmingham, Eng.**—An important step relating to the trade between the Continent and Britain is the determination of merchants to insist on the fulfillment of contracts in the currency named in the contract irrespective of any change which may have occurred in the value of such currency.

A meeting of the National Association of Iron and Steel stockholders, which includes merchants in Birmingham and other parts of the country, was summoned expressly to consider the effect of the suspension of the gold standard in connection with the purchases of foreign material.

Inquiries on the Birmingham market revealed the fact that as yet there has been no resumption of trading conditions on the free scale which prevailed previously. It remains to be seen whether the foreign producers will fulfill their contracts in the way suggested by the stockholders' association. Meanwhile consignments are coming in against old contracts and rerollers are not suffering inconvenience, as they have been in the habit of holding fairly heavy stocks.

The quarterly meeting of the Midland iron trade met under more cheerful circumstances than at any time this year, sentiment being bright though the volume of business is little more than before the financial crisis. The bright spots have been mainly confined to semifinished steel, pig iron, galvanized sheets and tin plates.

In semifinished specifications have been heavier as a direct consequence of cessation of business with the Continent. This is only temporary until some agreed basis with foreign houses can be fixed. Meanwhile British makers have improved their position in price and order books. The usual quotation for soft billets is now £5 5s ($20.21). Sheet bars are also in a stronger position at £5 2s 6d ($19.73) and some South Wales firms are off the market.

**Price Cutting Kills Profits**

As far as finished steel is concerned the position continues depressing. Engineers in the Midlands are struggling to obtain contracts but complain of the ruthless cutting of prices which makes the business hardly worth while. The Guest Keen Baldwin combine is reopening its Dowlais steelworks, finding employment for 300 men. This is an encouraging sign of the improvement which has taken place in South Wales, most of it being confined to the galvanized sheet and tinplate industries. In the Barrow-in-Furness district works are in full operation on rail orders.

On the north east coast there are bigger shipments from the Tees, an increased volume of business with home consumers and a sharp rise in prices of hematite, which reflect the improvement which has followed the depreciation of sterling. The returns of imports into the Tees during September show that only 1675 tons of pig iron were imported in September as against 2294 in August.

## Current Iron and Steel Prices of Europe

| Dollars at Rates of Exchange, Oct. 22 (a) | British gross tons U. K. ports | | Continental metric tons Channel or North Sea ports | |
|---|---|---|---|---|
| **Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)** | | | | |
| **PIG IRON** | | | | |
| Foundry, 2.50-3.00 Silicon | $11.52 | 2 18 6 | $9.26 to $9.46 | 2 7 0 to 2 8 0 |
| Basic bessemer | 11.82 | 3 0 0* | 8.08 to 8.27 | 2 1 0 to 2 2 0 |
| Hematite, Phos. .03-.05 | 12.81 | 3 5 0 | ..... | ..... |
| **SEMIFINISHED STEEL** | | | | |
| Billets | $20.69 | 5 5 0 | $11.03 to $11.23 | 2 16 0 to 2 17 0 |
| Wire rods, No. 5 gage | 33.49 | 8 10 0 | 19.70 to 20.69 | 5 0 0 to 5 5 0 |
| **FINISHED STEEL** | | | | |
| Standard rails | $32.51 | 8 5 0 | $23.15 | 5 17 6 |
| Merchant bars | 1.23c | 7 0 0 | .56c to .57c | 3 2 0 to 3 3 0 |
| Structural shapes | 1.30c | 7 15 0 | .54c to .55c | 3 0 0 to 3 1 0 |
| Plates, †¼-in. or 5mm. | 1.45c | 8 5 0 | .64c to .65c | 3 12 0 to 3 12 6 |
| Sheets, black, 24 gage or 0.5mm. | 1.54c | 8 15 0 | 1.37c to 1.40c | 7 12 6 to 7 15 0 |
| Sheets, gal., 24 gage, corr. | 1.72c | 9 15 0 | 1.49c to 1.51c | 8 5 0 to 8 7 6 |
| Bands and strips | 1.67c | 9 10 0 | .72c to .74c | 4 0 0 to 4 2 6 |
| Plain wire, base | 1.50c | 8 10 0 | .91c | 5 1 3 |
| Galvanized wire, base | 1.94c | 11 0 0 | 1.11c | 6 3 9 |
| Wire nails, base | 1.94c | 11 0 0 | .92c | 5 2 6 |
| Tin plate, box 108 lbs. | $ 3.05 | 0 15 6 | $2.59 | 0 13 2‡ |

British ferromanganese £20 10s 6d ($80.85) delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($35.46) f.o.b.

**Domestic Prices at Works or Furnace—Last Reported**

| | £ s d | French Francs | | Belgian Francs | | Renten Marks | |
|---|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5 | $11.52 | 2 18 6 | $10.84 | 275(2) | $11.56 | 410 | $18.49 | 78 |
| Basic bessemer pig iron | 11.82 | 3 0 0* | ..... | ..... | 11.00 | 390 | 20.26 | 85.50 |
| Furnace coke | 2.17 | 0 11 0 | 5.71 | 145 | 5.22 | 185 | 5.07 | 21.40 |
| Billets | 20.19 | 5 2 6 | 19.31 | 490 | 15.09 | 535 | 26.19 | 110.50 |
| Standard rails | 1.45c | 8 5 0 | 1.41c | 785 | 1.57c | 1,210 | 1.36c | 127 |
| Merchant bars | 1.23c | 7 0 0 | .90c | 500 | .73c | 560 | 1.37c | 128 |
| Structural shapes | 1.54c | 8 15 0 | .99c | 550 | .72c | 555 | 1.34c | 125 |
| Plates, †¼-in. or 5mm. | 1.58c | 9 0 0 | 1.26c | 700 | .89c | 695 | 1.57c | 147 |
| Sheets, black, 24 ga. or 0.5mm. | 1.54c | 8 15 0 | 2.09c | 1,160 | 1.82c | 1,400 | 3.32c | 255 |
| Sheets, galv., corr., 24 ga. or 0.5mm. | 1.72c | 9 15 0 | 2.39c | 1,325 | 2.05c | 1,575 | 3.53c | 330 |
| Plain wire | 1.50c | 8 10 0 | 1.68c | 935 | 2.08c | 1,600 | 2.21c | 207 |
| Bands and strips | 1.67c | 9 10 0 | 1.13c | 625 | .91c | 700 | 1.58c | 148 |

*Basic. †British ship-plates, Continental bridge plates. ‡German.

British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

(a) This week the lower exchange rate for sterling is used in computing British prices, depressing them abnormally. It is suggested in the cable from London that British producers will advance their quotations to neutralize this artificial decline in their prices.

# Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

## New England

EAST HAMPTON, CONN.—Plant of Valley Foundry Co., owned by Connecticut Foundry Co., Rocky Hill, Conn., has suffered damage by fire.

## Pennsylvania

MARYSVILLE—Walker Emergency Lighting Co. has been incorporated with $100,000 capital and 1000 shares common stock to manufacture lighting devices, with Delaware charter, by Corporation Guarantee & Trust Co., Wilmington, Del.

## Ohio

CLEVELAND—Arthur G. McKee & Co., 2422 Euclid avenue, has been given contract by Steel Co. of Canada Ltd., for remodeling its furnaces at Hamilton, Ont., at $100,000.

LIMA—City of Lima, David A. Bogart, mayor, is considering construction of a municipal electric light plant to be completed by November, 1932, when present contract expires. Engineer not selected.

PAINESVILLE—Apex Electric Co., 1067 East 152nd street, Cleveland, is moving its refrigeration division from Fort Wayne, Ind., to Painesville, where it will use 30,000 square feet of factory space.

YOUNGSTOWN — Automatic Industries Inc., 49 South Forest street, will build a 1-story addition to its plant for manufacture of mechinical equipment.

## Illinois

CHICAGO—Chicago Welding Sales Co., 1 North La Salle street, room 1349, has been incorporated with $2500 capital to handle welding supplies, Walter Clifford Bowman, 1 North La Salle street, is correspondent.

CHICAGO—Brown Locknut Corp., 166 West Jackson boulevard, has been incorporated with $100,000 preferred stock and 10,000 shares no par value common to manufacture hardware, by J. H. Hines, George R. Hess and Janet Bray. Altheimer & Mayer, 10 South La Salle street, are correspondents.

PEORIA—Herman Body Co., 4420 Clayton street, St. Louis, Mo., is planning construction of a plant here for manufacture of truck bodies.

## Southern States

MOBILE, ALA.—Coastal Petroleum Co., recently organized by Victor H. Smith, Tulsa, Okla., and associates, has let contract to J. B. Devine Mfg. Co., Joliet, Ill., for construction of a plant to cost $200,000. Contract for 22 oil storage tanks from 500 to 55,000 barrels capacity each have been awarded to Chicago Bridge & Iron Works, Chicago.

WASHINGTON—Bureau of supplies and accounts, navy department, on schedule 6757, will take bids until Nov. 3 for one horizontal air compressor, duplex, two-stage, with all accessories.

MONROE, LA.—American Airways Inc., M. R. Slater chief engineer, is having plans made for an airport terminal here, including repair shop for planes.

NEW ORLEANS—Jefferson Lake Oil Co., New Orleans Bank building, has completed plans for a sulphur mining plant in Iberia parish, including a power plant unit. Arthur Barba is president of the company.

OAKDALE, LA.—Plans for construction of a light and power plant here have been abandoned, following agreement with the Louisiana Public Utilities Co., which already has a plant in operation.

SHREVEPORT, LA.—Kalmbach-Burkett Co. will rebuild its burned feed mill and install a conveyor system and elevating machinery.

HATTIESBURG, MISS.—School board will convert school heating systems to natural gas. Contract to Komp Machinery Co., Hattiesburg, for necessary changes and installations.

## Missouri

KANSAS CITY, MO.—Rouse Mfg. Co., Earl E. Rouse president, has started construction of a plant here to manufacture hotel and restaurant equipment, at 1206 East Sixth street.

ST. LOUIS—Sachs Corp. has been incorporated by S. C. Sachs, 1422 Olive street, to manufacture electrical and radio equipment.

ST. LOUIS—P-B Chain Mfg. Co. has been incorporated with $15,000 capital to manufacture tire chains, by E. T. Rosenblum, 810 North Sixth street.

ST. LOUIS—Norma Mfg. Co. has been incorporated with $15,000 capital to manufacture automotive and aviation carburetors, by M. W. Fardwell, 712 North First street.

## Oklahoma

EL RENO—Federal reformatory here will erect 2-story power plant and shop unit, to cost $145,000. Hawk & Parr, Hales building, Oklahoma City, Okla., are architects. Sanford Bates, bureau of federal prisons, Washington, is in charge of construction plans.

HOMINY—W. R. Grimshaw Construction Co., Philcade building, Tulsa, Okla., has been awarded contract by Stanolind Pipe Line Co. for two pumping stations, at Hominy and Hulah, Okla., each 36 x 66 feet, concrete and steel, costing about $15,000. C. M. Scott, Philcade building, Tulsa, is chief engineer.

MUSKOGEE—Site has been bought for ice and cold storage plant to be built by George E. Wells Inc., Little Rock, Ark., including air compressors, ammonia pumps and auxiliary equipment.

## North Dakota

WAHPETON—Carl Stevens, superintendent of the Indian school, will receive bids until Oct. 27 for steel equipment for its shop school and for woodworking tools, motor-driven, for its shop.

## Pacific Coast

LOS ANGELES—Pennsylvania Iron & Steel Co., 2308 Santa Fe avenue, has awarded a contract for a 1-story addition 72 x 145 feet.

## Dominion of Canada

NANAIMO, B. C.—Nanaimo Wood Products Ltd., Bastion street, is having plans made for a 2-story plant to cost $25,000. Equipment will be purchased.

FORT ERIE, ONT.—Falls Electric Resistors Ltd. has been incorporated with 40,000 shares of no par value to manufacture resistance elements and other metal products, by Robert B. Law, Welland, Ont.

HAMILTON, ONT.—Ramsay Hardware Ltd. has been incorporated with $40,000 capital to manufacture hardware by Thomas Ramsay, Hamilton.

LEASIDE, ONT.—DeForest Crosley Radio Co. Ltd., 245 Carlaw avenue, Toronto, Ont., J. E. Hahn president, is having plans prepared for a plant to be erected next spring.

TRENTON, ONT.—Department of National Defence, Parliament buildings, Ottawa, Canada, will establish an airport here costing $3,500,000, including hangars, machine and repair shops.

TORONTO, ONT.—Etco Sales & Mfg. Co. Ltd. has been incorporated with 400 shares no par value to manufacture automotive parts and accessories, by John P. Moss, Toronto.

WELLAND, ONT.—American Manganese Steel Co., Chicago, has been granted $20,000 fixed assessment for ten years on buildings and land recently purchased from Carbon Alloy Steels and will guarantee to spend $150,000 in rebuilding and equipping the plant for immediate operation with 150 men for 11 months each year.

# LARGEST BUILDERS OF THE WORLD'S LARGEST CRANES

## Alliance Products

STANDARD CRANES
Up to 430 tons capacity

STRIPPING CRANES
Up to 320 tons capacity

COMBINATION CHARGERS and STRIPPERS
Up to 200 tons capacity

—+—

Ladle Cranes
Ingot Strippers
Soaking Pit Cranes
Open Hearth Charging Machines
Slab and Billet Charging and Drawing Machines
Gantry Cranes
Ore and Coal Bridges
Car Dumpers
Forging Manipulators
Steam Drop Forge Hammers
Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

*271 of 100 Tons Capacity and over*

LADLE AND STANDARD CRANES

| | | |
|---|---|---|
| 59 | | 100 tons |
| 2 | WORM DRIVEN Ladle, | 100 tons |
| 2 | | 115 tons |
| 6 | WORM DRIVEN Ladle, | 125 tons |
| 45 | | 125 tons |
| 30 | | 150 tons |
| 3 | WORM DRIVEN Ladle, | 150 tons |
| 6 | WORM DRIVEN Ladle, | 160 tons |
| 2 | WORM DRIVEN Ladle, | 165 tons |
| 4 | WORM DRIVEN Ladle, | 175 tons |
| 27 | | 175 tons |
| 3 | WORM DRIVEN Ladle, | 200 tons |
| 4 | | 200 tons |
| 5 | | 225 tons |
| 1 | | 250 tons |
| 3 | WORM DRIVEN Ladle, | 250 tons |
| 3 | WORM DRIVEN Ladle, | 275 tons |
| 1 | | 275 tons |
| 1 | | 300 tons |
| 3 | | 430 tons |

STRIPPING CRANES

| | | |
|---|---|---|
| 8 | | 100 tons |
| 1 | | 125 tons |
| 21 | | 150 tons |
| 19 | | 200 tons |
| 1 | Single Ram, | 320 tons |

COMBINATION CHARGERS AND STRIPPERS

| | | |
|---|---|---|
| 3 | | 100 tons |
| 1 | | 125 tons |
| 3 | | 150 tons |
| 4 | | 200 tons |

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THE ALLIANCE MACHINE CO.
ALLIANCE, OHIO, U.S.A.
*ENGINEERS AND BUILDERS*



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**COAL** Pittsburgh Gas, Steam and Connellsville Coking Coals Jerome Low Volatile Smokeless for By-Product mixtures bunkering and steam purposes where smokeless fuel is required. Modern cleaning equipment guarantees uniformly Low Ash, Low Sulphur Product.

**COKE** Standard Low Sulphur Connellsville Coke for Blast Furnaces, Foundries and all other purposes.

**Production 7,000,000 tons annually** **Daily shipments 23,000 tons**

**ANY RAILROAD DELIVERY**